



Cisco ME 3800X and ME 3600X Switch Hardware Installation Guide

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Cisco ME 3800X and ME 3600X Switch Hardware Installation Guide
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Preface

Audience

This guide is for the person installing the Cisco Metro Ethernet (ME) 3800X and ME 3600X Series switch, also known as *the switch*.

Purpose

This guide describes the hardware features of the switch. It describes the physical and performance characteristics of the switch, explains how to install it, and provides troubleshooting information.

This guide does not describe system messages that you might receive or how to configure your switch. For more information, see the switch software configuration guide, the switch command reference, and the switch system message guide on Cisco.com at:

http://www.cisco.com/go/me3800x_docs



Note

Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

**Warning****IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

The safety warnings for this product are translated into several languages in the *Regulatory Compliance and Safety Information for the Cisco ME 3800X and ME 3600X Switches* on Cisco.com. The EMC regulatory statements are also included in that guide.

Related Publications

These documents provide information about the switches and are available from this Cisco.com site:

http://www.cisco.com/go/me3800x_docs

- *Release Notes for the Cisco ME 3800X and ME 3600X Switch*

**Note**

Before installing, configuring, or upgrading the switch, see the release notes on Cisco.com for the latest information.

- *Cisco ME 3800X and ME 3600X Switch Software Configuration Guide*
- *Cisco ME 3800X and ME 3600X Switch Command Reference*
- *Cisco ME 3800X and ME 3600X System Message Guide*
- *Cisco ME 3800X and ME 3600X Switch Hardware Installation Guide*
- *Cisco ME 3800X and ME 3600X Switch Getting Started Guide*
- *Regulatory Compliance and Safety Information for the Cisco ME 3800X and ME 3600X Switches*
- *Installation Note for the Cisco ME 3800X and ME 3600X Switch Power Supply and Fan Modules*
- *Cisco Small Form-Factor Pluggable Modules Installation Notes*
- *Cisco CWDM GBIC and CWDM SFP Installation Notes*

These compatibility matrix documents are available from this Cisco.com site:

http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html

- *Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix*
- *Cisco 100-Megabit Ethernet SFP Modules Compatibility Matrix*
- *Cisco CWDM SFP Transceiver Compatibility Matrix*
- *Cisco Small Form-Factor Pluggable Modules Compatibility Matrix*
- *Compatibility Matrix for 1000BASE-T Small Form-Factor Pluggable Modules*

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.



CHAPTER 1

Product Overview

The Cisco Metro Ethernet (ME) 3600X switch is an Ethernet access switch.

The Cisco ME 3800X switch is a carrier Ethernet aggregation switch.

Throughout this document, the Cisco ME 3800X and ME 3600X are referred to as *the switch*.

- [Setting Up the Switch, page 1-1](#)
- [Switch Models, page 1-1](#)
- [Front Panel, page 1-2](#)
- [Rear Panel, page 1-10](#)
- [Power Supply Module Features, page 1-11](#)
- [Fan Module, page 1-12](#)
- [Management Options, page 1-13](#)

Setting Up the Switch

See the *Cisco ME 3800X and ME 3600X Switch Getting Started Guide* on Cisco.com for instructions on how to initially configure your switch. The getting started guide also covers switch management options, basic rack-mounting procedures, port and module connections, power connection procedures, and troubleshooting.

For instructions on setting up your switch using the CLI, see [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Switch Models

You can deploy the switch as a backbone switch, aggregating 10BASE-T, 100BASE-TX, 1000BASE-T, and fiber-optic Ethernet traffic from other network devices.

See the switch software configuration guide for examples that show how you might deploy the switch in your network.

Table 1-1 Cisco ME 3800X and ME 3600X Models and Descriptions

Switch Model	Description
Cisco ME-3800X-24FS-M	24 Gigabit Ethernet small form-factor pluggable (SFP) downlink ports and 2 SFP+ (10 Gigabit) uplink ports; supports removable, hot-swappable AC and DC input power supply and fan modules.
Cisco ME-3600X-24FS-M	24 Gigabit Ethernet SFP downlink ports and 2 SFP+ (10 Gigabit) uplink ports; supports removable, hot-swappable AC and DC input power supply and fan modules.
Cisco ME-3600X-24TS-M	24 10/100/1000BASE-T copper downlink ports and 2 SFP+ (10 Gigabit) uplink ports; supports removable, hot-swappable AC and DC input power supply and fan modules.

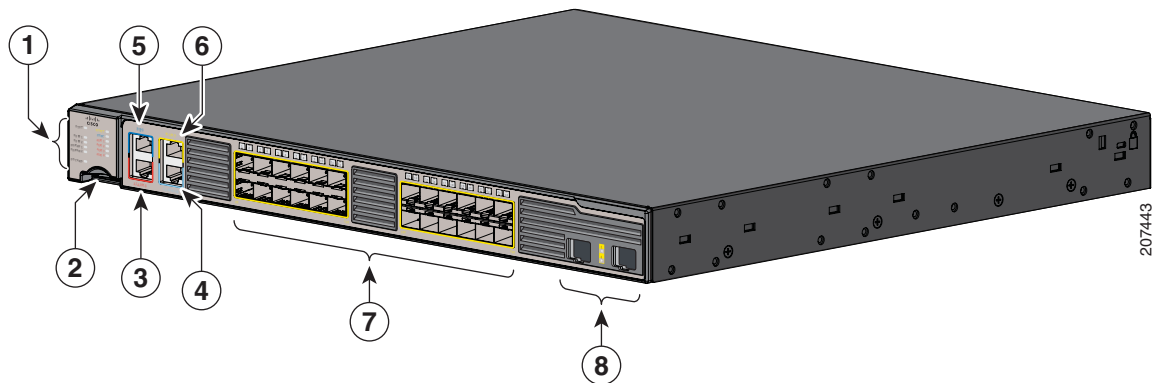
Front Panel


Note

The front panel is the same for the Cisco ME 3800X-24FS-M and Cisco ME 3600X-24FS-M.

Figure 1-1 shows the Cisco ME 3800X-24FS-M front panel.

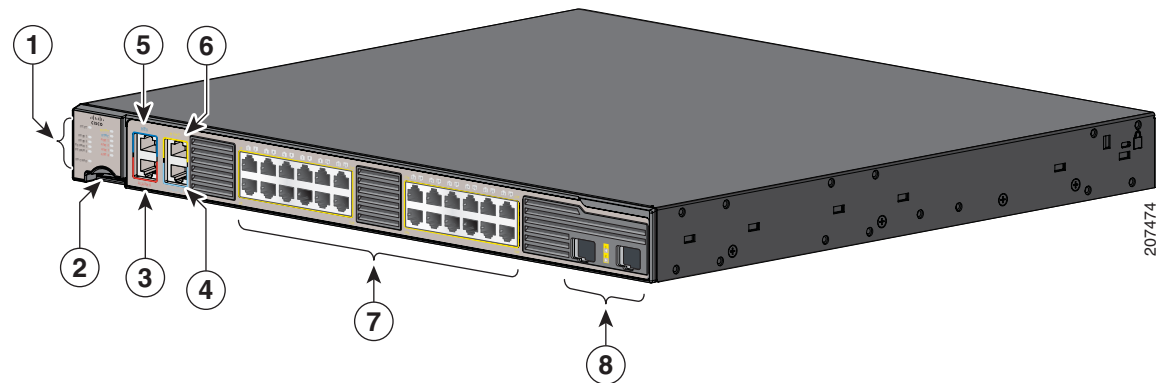
The SFP downlink ports are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2). Port 3 is above port 4, and so on.

Figure 1-1 Cisco ME 3800X-24FS-M Front Panel

1	LEDs	5	BITS port
2	SD flash card slot	6	Ethernet management port
3	Alarm input port	7	SFP module ports (downlink)
4	Console port	8	SFP+ module slots (uplink)

Figure 1-2 shows the Cisco ME-3600X-24TS-M. The copper 10/100/1000Base-T/TX downlink ports are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2). Port 3 is above port 4, and so on.

Figure 1-2 Cisco ME-3600X-24TS-M Front Panel



1	LEDs	5	BITS port
2	SD flash card slot	6	Ethernet management port
3	Alarm input port	7	10/100/1000BASE-T/TX ports (downlink)
4	Console port	8	SFP+ module slots (uplink)

BITS Port

The Building Integrated Timing Supply (BITS) port is an RJ-45 interface that provides external synchronized clocking through a timing signal generator (TSG). The BITS input is an external timing reference that must be traceable to a stratum 3 clock or better. The BITS port on the switch can be configured to accept either a T1 or an E1 framed input. Although this clock input is T1 or E1 framed, it does not carry data and cannot be used for any other purpose than to derive clocking for the system.

Alarm Input Port

The switch supports four alarm inputs. The alarm input is a dry-contact alarm port. Use the CLI to define each alarm input to respond to a normally open or closed dry-contact closure and to define the alarm severity as minor, major, or critical. When a condition triggers an alarm, the console displays an alarm message, and the corresponding Alarm LED responds (see the [“Alarm LEDs Description”](#) section on page 1-9).

Management and Console Port

You can connect the switch to a host such as a Windows workstation or a terminal server through the 10/100/1000 Ethernet management port or the console port. The 10/100/1000 Ethernet management port connection uses a standard RJ-45 crossover or straight-through Ethernet cable. The console port connection uses a RJ-45-to-DB-9 female cable.

The Ethernet management port operates in any combination of 10, 100, or 1000 Mb/s, and its traffic is isolated from the other ports. See [Table 1-7](#) for descriptions of the Ethernet management port LEDs. See the [“10/100/1000 Ethernet Management Port”](#) section on [page B-3](#) for pinout information.

For console port and adapter pinout information, see the [“Console Port Adapter Pinouts”](#) section on [page B-8](#).

10/100/1000 Gigabit Ethernet Ports

The 10/100/1000 Ethernet ports use standard RJ-45 connectors with Ethernet pinouts. The maximum cable length is 328 feet (100 meters). The 100BASE-TX and 1000BASE-T traffic requires Category 5, Category 5e, or Category 6 unshielded twisted pair (UTP) cable. The 10BASE-T traffic can use Category 3 or Category 4 UTP cable.

The autonegotiation feature is enabled by default. The switch ports configure themselves to operate at the speed of attached devices. If the attached device does not support autonegotiation, you can explicitly set the switch port speed and the duplex parameters. To maximize performance, either let the ports autonegotiate both speed and duplex, or set the port speed and duplex parameters on both ends of the connection.

For simplified cabling, the automatic medium-dependent interface crossover (auto-MDIX) feature is enabled by default. The switch detects the required cable type for copper Ethernet connections and configures the interface accordingly. You can use either a crossover or a straight-through cable for connections to a switch 10/100/1000 Ethernet port, regardless of the type of device on the other end of the connection.

SFP+ and SFP Modules

The switch 10-Gigabit Ethernet SFP+ modules are used for connections to other devices. These transceiver modules are field-replaceable, providing the uplink interfaces when inserted in an SFP+ module slot. You can use any combination of SFP+ or SFP modules. The SFP+ modules have LC connectors for fiber-optic connections. The SFP+ module slots support SFP+ and 1000BASE-X SFP modules. The SFP+ module slots do not support 100BASE-X and 1000BASE-T modules.

Use only Cisco SFP+ or SFP modules on the switch. Each Cisco module has an internal serial EEPROM that is encoded with security information.

For more information on configuring interfaces, see the switch software configuration guide.

Table 1-2 Supported Cisco SFP+ Modules

Part Number	Description
SFP-10G-ER=	10GBASE-ER
SFP-10G-LR=	10GBASE-LR
SFP-10G-SR=	10GBASE-SR
SFP-10G-LRM=	10GBASE-LRM
SFP-10G-ZR=	10GBASE-ZR
SFP-H10GB-CU1M=	1-meter copper SFP+ cable
SFP-H10GB-CU3M=	3-meter copper SFP+ cable
SFP-H10GB-CU5M=	5-meter copper SFP+ cable

Table 1-3 Supported Cisco SFP Modules

Part Number	Description
GLC-FE-100BX-D GLC-FE-100BX-U	100BASE-BX10
GLC-FE-100EX	100BASE-EX
GLC-FE-100FX	100BASE-FX
GLC-FE-100LX	100BASE-LX10
GLC-FE-100ZX	100BASE-ZX
GLC-BX-D GLC-BX-U	1000BASE-BX10
GLC-LH-SM SFP-GE-L	1000BASE-LX/LH
GLC-SX-MM SFP-GE-S	1000BASE-SX
GLC-T SFP-GE-T	10/100/1000BASE-T
GLC-ZX-SM	1000BASE-ZX
CWDM-SFP-xxxx	CWDM
DWDM-SFP-xxxx	DWDM
CAB-SFP-50CM	SFP interconnect cable (50 cm)

For more information about SFP+ and SFP modules, see your SFP+ and SFP module documentation and the [“Installing and Removing SFP+ and SFP Modules”](#) section on page 2-15. For cable specifications, see [Appendix B, “SFP and SFP+ Module Connectors.”](#)

SFP Module Patch Cable

The SFP downlink ports supports the SFP module patch cable, a 0.5-meter, copper, passive cable with SFP module connectors at each end. This cable is only used with 1-Gigabit Ethernet SFP ports to connect two switches in a cascaded configuration.

See the [“Inserting and Removing the SFP+ Module Patch Cable”](#) section on page 2-17 for more information about using the SFP module patch cable.

You can order the SFP module patch cable (part number CAB-SFP-50CM=).

SD Memory Slot

The switch has an SD (secure digital) memory slot for additional non-volatile storage. You can save configurations or Cisco IOS images and transfer them to other systems. The memory slot supports standard SD (1 MB and 2 GB) memory cards or SDHC (4 GB) memory cards.

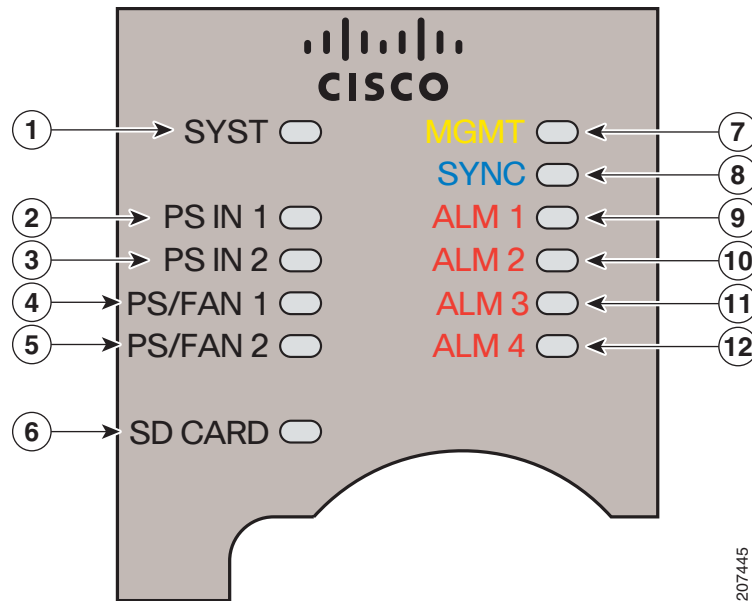
LEDs

You can use the switch system and port LEDs to monitor switch activity and performance.

- [Switch LED Panels, page 1-7](#)
- [System LED Description, page 1-7](#)
- [Power Supply Module Input LED Description, page 1-8](#)
- [Power Supply and Fan LED Description, page 1-8](#)
- [Ethernet Management Port LED Description, page 1-8](#)
- [Alarm LEDs Description, page 1-9](#)
- [Sync LED Description, page 1-9](#)
- [SD Card LED Description, page 1-9](#)
- [Port LEDs Description, page 1-10](#)

Switch LED Panels

Figure 1-3 Cisco ME 3800X and ME 3600X Switch LEDs



1	SYST (system) LED	7	MGMT (Ethernet management port) LED
2	PS IN 1 (power supply module 1 input) LED	8	SYNC LED
3	PS IN 2 (power supply module 2 input) LED	9	ALM 1 (alarm input 1) LED
4	PS/FAN 1 (power supply module output or fan module 1) LED	10	ALM 2 (alarm input 2) LED
5	PS/FAN 2 (power supply module output or fan module 2) LED	11	ALM 3 (alarm input 3) LED
6	SD CARD LED	12	ALM 4 (alarm input 4) LED

System LED Description

Table 1-4 System LED

Color	System Status
Off	System is not powered on.
Blinking green	POST ¹ is in progress.
Green	System is operating normally.
Amber	System is receiving power but is not functioning properly.

1. POST = power-on self-test.

Power Supply Module Input LED Description

Table 1-5 PS IN 1 and PS IN 2 LEDs

Color	System Status
Off	Power supply module (1 or 2) is not installed.
Green	Power supply module (1 or 2) is installed and receiving power.
Amber	Power supply module (1 or 2) is installed but not receiving power in an acceptable range.

Power Supply and Fan LED Description

Table 1-6 PS/FAN1 and PS/FAN 2 LEDs

Color	System Status
Off	Power supply module (1 or 2) is either not installed or not producing power. Fan module is not installed.
Green	Power supply module (1 or 2) is installed and producing power in an acceptable range; the fans are operating normally. Fan module is installed; the fans are operating normally.
Red	Power supply module (1 or 2) is installed but not producing power in an acceptable range, or a fan has failed. Fan module is installed, but one of the fans has failed.

Ethernet Management Port LED Description

Table 1-7 Ethernet Management Port LED

Color	System Status
Off	No link, or port was administratively shut down.
Green	Link present but not sending or receiving data.
Blinking green	Activity. Port is sending or receiving data.
Alternating green/amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC ¹ errors, and alignment and jabber errors ² are monitored for a link-fault indication.

1. CRC = cyclic redundancy check.

2. Jabber errors occur when data packets exceed the prescribed lengths.

Alarm LEDs Description

Table 1-8 Alarm LEDs

Color	System Status
Off	No alarm
Amber	Minor alarm
Red	Major alarm
Blinking red	Critical alarm

Sync LED Description

Table 1-9 Sync LEDs

Color	System Status
Green	The synchronous Ethernet internal clocking source is in a synced/locked state from line or BITS timing input.
Amber	The synchronous Ethernet internal clocking source is in the holdover state.
Off	The synchronous Ethernet internal clocking source is in the free-running state.

SD Card LED Description

Table 1-10 SD Card LEDs

Color	System Status
Off	SD card is not installed.
Green	SD card is installed.
Amber	Error accessing the SD card.
Blinking Green	SD data transfer in progress.

Port LEDs Description

Each RJ-45 port, SFP module slot, and SFP+ module slot has a port LED. These port LEDs, as a group or individually, display information about the switch and about the individual ports.

Table 1-11 *Port LED*

LED Color	Meaning
Off	No link, or port was administratively shut down.
Green	Link present but not sending or receiving data.
Blinking green	Activity. Port is sending or receiving data.
Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC errors, and alignment and jabber errors are monitored for a link-fault indication.
Amber	Port is blocked by Spanning Tree Protocol (STP) and is not forwarding data. After a port is reconfigured, the port LED can remain amber for up to 30 seconds as STP checks the switch for possible loops.

Rear Panel

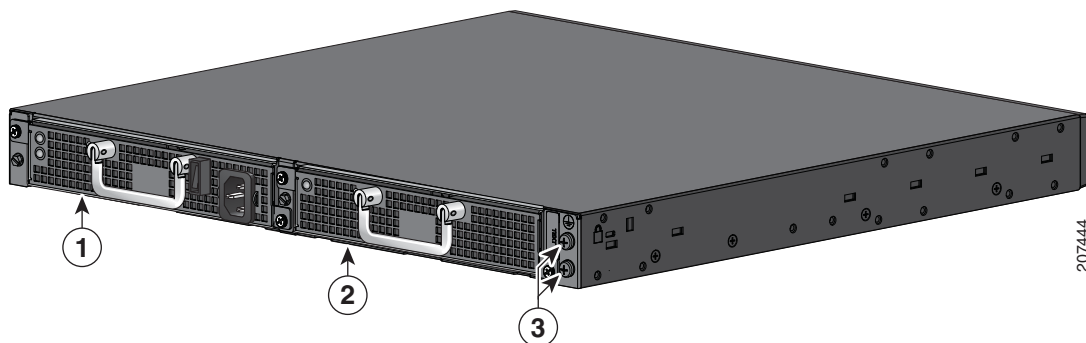


Note

The rear panel is the same for the Cisco ME 3800X and ME 3600X switches.

The rear panel on the switch has two power supply module slots and a ground connector. Power supply module slots can accept AC or DC input power supply or a fan module. See [Figure 1-4](#).

Figure 1-4 *Switch Rear Panel*



1	Power supply module slot 2 (AC input power supply installed)	3	Chassis ground connection
2	Power supply module slot 1 (fan module installed)		

Power Supply Module Features

The Cisco ME 3800X and ME 3600X switches support two power supply modules, either AC or DC input. You can install two AC or DC input power supply modules, a mix of AC and DC input power supply modules, or one power supply and one fan module. The power supply and fan modules are hot-swappable.



Caution

Both slots must be occupied either by two power supply modules or a power supply and a fan module. Do not run the switch with an empty slot unless you are replacing a faulty power supply or fan module. Running the switch with an empty slot triggers an alarm.

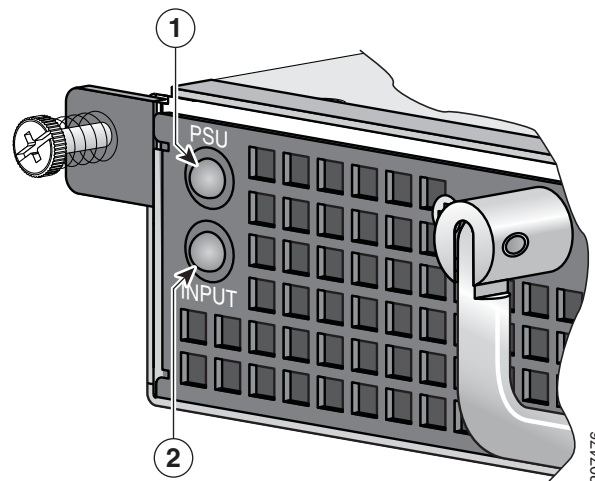
Each power supply module contains three fans. The switch can operate safely if one fan fails. A fan failure triggers an alarm. When a fan fails, replace the power supply module immediately.

See [Chapter 3, “Installing and Removing AC and DC Input Power Supply and Fan Modules,”](#) for instructions on installing the AC and DC input power supply and fan module. See [Appendix A, “Technical Specifications,”](#) for voltage and other specifications.

Power Supply Module LEDs

The power supply module LEDs show the status of the power supply modules. [Figure 1-5](#) applies to both AC and DC input power supply modules.

Figure 1-5 Power Supply Module LEDs



1	Power supply module status LED	2	Power supply input status LED
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Table 1-12 Power Supply Module Status LED

Color	System Status
Green	The power supply module is installed, output is OK, all internal fans OK, and power switch is ON.
Red	The power supply module is installed, output has failed or one of the internal fans has failed, power switch is ON.
Off	The power supply module is installed, power switch is OFF, no input power, or invalid input power.

Table 1-13 Power Supply Input LED

Color	System Status
Green	The power supply module is installed, AC or DC input power is OK, power switch can ON or OFF.
Amber	The power supply module is installed, AC or DC input power is insufficient or not present and a redundant power supply is functioning properly.
Off	The power supply module is installed, no input power present at both power supply modules.

Fan Module

The fan module provides cooling and proper airflow when only one power supply module is installed. The fan module is hot-swappable.



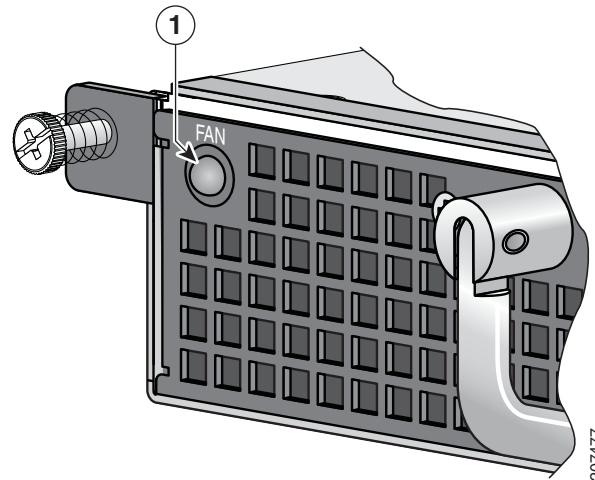
Caution

Both slots must be occupied either by two power supply modules or a power supply and a fan module. Do not run the switch with an empty slot unless you are replacing a faulty power supply or fan module. Running the switch with an empty slot triggers an alarm.

Each fan module contains three fans. The switch can operate safely if one fan fails. A fan failure triggers an alarm. When a fan fails, replace the fan module immediately.

Fan Module LED

Figure 1-6 Fan Module LED



1	Fan module LED
----------	----------------

Table 1-14 FAN LED

Color	System Status
Green	All internal fans are OK.
Red	One or more internal fans have failed.
Off	The fan module is not installed, or power is not present.

Management Options

- Cisco IOS CLI

You can fully configure and monitor the switch from the CLI. You can access the CLI either by connecting your management station directly to the switch console port or by using Telnet from a remote management station. See the switch command reference on Cisco.com for more information.

For setup instructions that use the CLI, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

- CiscoView application

The CiscoView device-management application displays the switch image so that you can set configuration parameters and view switch status and performance information. The CiscoView application, which you purchase separately, can be a standalone application or part of a Simple Network Management Protocol (SNMP) platform. See the CiscoView documentation for more information.

- SNMP network management

You can manage switches from a SNMP-compatible management station that is running platforms such as HP OpenView or SunNet Manager. The switch supports a comprehensive set of Management Information Base (MIB) extensions and four Remote Monitoring (RMON) groups. See the switch software configuration guide on Cisco.com and the documentation that came with your SNMP application for more information.

Network Configurations

See the switch software configuration guide on Cisco.com for an explanation of network configuration concepts. The software configuration guide also provides examples of network configurations that use the switch to create dedicated network segments that are interconnected through Ethernet connections.



CHAPTER 2

Switch Installation

Read the topics and perform the procedures in this order:

- [Warnings, page 2-1](#)
- [Installation Guidelines, page 2-4](#)
- [Verifying Switch Operation, page 2-4](#)
- [Installing the Switch, page 2-5](#)
- [Installing and Removing SFP+ and SFP Modules, page 2-15](#)
- [Inserting and Removing the SFP+ Module Patch Cable, page 2-17](#)
- [Connecting to the 10/100/1000 Ports, page 2-19](#)
- [Connecting to Fiber-Optic SFP+ and SFP Modules, page 2-20](#)
- [Where to Go Next, page 2-20](#)

Warnings

These warnings are translated into several languages in the *Regulatory Compliance and Safety Information for the Cisco ME 3800X and ME 3600X Switches* document that ships with the switch.

These warning statements apply to all the switches:



Warning

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43



Warning

Do not stack the chassis on any other equipment. If the chassis falls, it can cause severe bodily injury and equipment damage. Statement 48



Warning

Ethernet cables must be shielded when used in a central office environment. Statement 171

Warnings



Note

Ethernet cables must be shielded and grounded at both ends when they are used in a central office environment.



Warning

Do not work on the system or connect or disconnect cables during periods of lightning activity.

Statement 1001



Warning

Read the installation instructions before connecting the system to the power source. Statement 1004



Warning

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006



Warning

There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Statement 1015



Warning

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

Statement 1017



Warning

The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019



Warning

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

**Warning**

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations.
Statement 1040

**Warning**

For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection.
10/100/1000 Ethernet Statement 1044

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

**Warning**

No user-serviceable parts inside. Do not open. Statement 1073

**Warning**

Installation of the equipment must comply with local and national electrical codes. Statement 1074

**Caution**

The intra-building port(s) of the equipment or subassembly is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly **MUST NOT** be metalically connected to interfaces which connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 5) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.

You can use the grounding lug to attach a wrist strap for ESD protection during servicing.

**Warning**

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of:
122°F (50°C) Statement 1047

**Warning**

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

Installation Guidelines

Before installing the switch, verify that these guidelines are met:

- For Ethernet ports and 1000BASE-T SFP module ports, cable lengths from the switch to connected devices can be up to 328 feet (100 meters).
- For cable requirements for SFP+ and SFP module connections, see the [“Cable Pinouts” section on page B-7](#).
- Operating environment is within the ranges listed in [Appendix A, “Technical Specifications.”](#)
- Front-panel indicators can be easily read, and access to ports is sufficient for unrestricted cabling.
- AC power cord reaches from the power outlet to the connector.
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure that the cabling is safely away from other devices that might damage the cables.
- Airflow around the switch and through the vents is unrestricted.

**Note**

If the switch is installed in a closed or multirack assembly, the temperature around it might be greater than normal room temperature.

- Before you connect the switch to a power source, note the power consumption specifications in [Appendix A, “Technical Specifications.”](#)

Verifying Switch Operation

Before installing the switch in a rack, on a wall, on a table, or on a shelf, you should power the switch and verify that the switch passes the power-on self-test (POST).

To power on the switch, see [Chapter 3, “Installing and Removing AC and DC Input Power Supply and Fan Modules.”](#)

When the switch begins POST, the System LED blinks green, and the other LEDs remain green. When the switch passes POST, the System LED becomes green. The other LEDs turn off and return to their operating status. If the switch fails POST, the System LED is amber.

**Note**

Contact Cisco Systems immediately if your switch fails POST.

Powering Off the Switch

After a successful POST, disconnect the power cord from the switch. Install the switch in a rack, on a wall, on a table, or on a shelf as described in the [“Installing the Switch” section on page 2-5](#).

Installing the Switch

- [Rack-Mounting, page 2-5](#)
- [Wall-Mounting, page 2-13](#)
- [Table- or Shelf-Mounting, page 2-15](#)

Rack-Mounting

To install the switch in a 19-inch, 23-inch, or a European Telecommunications Standards Institute (ETSI) rack, follow these instructions. (The ETSI racks require optional mounting hardware.)

- [Attaching Brackets to the Switch, page 2-6](#)
- [Mounting in a Rack, page 2-11](#)



Warning

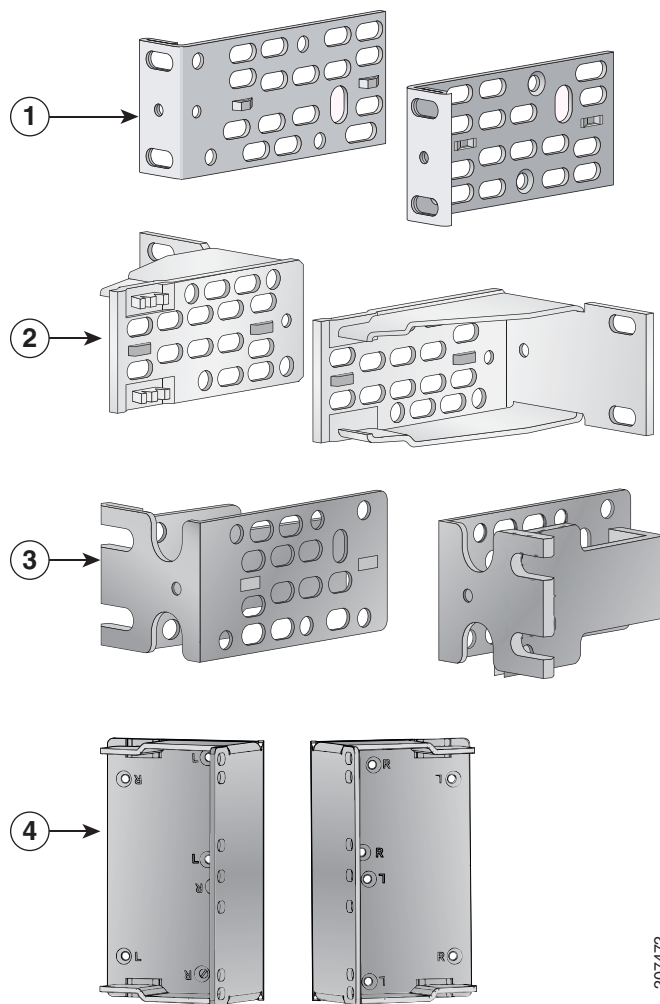
To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

Attaching Brackets to the Switch

The bracket orientation and the brackets that you use depend on whether you are attaching the brackets for a 19-inch, 23-inch, or an ETSI rack. [Figure 2-1](#) shows the types of mounting brackets.

Figure 2-1 Rack-Mounting Brackets



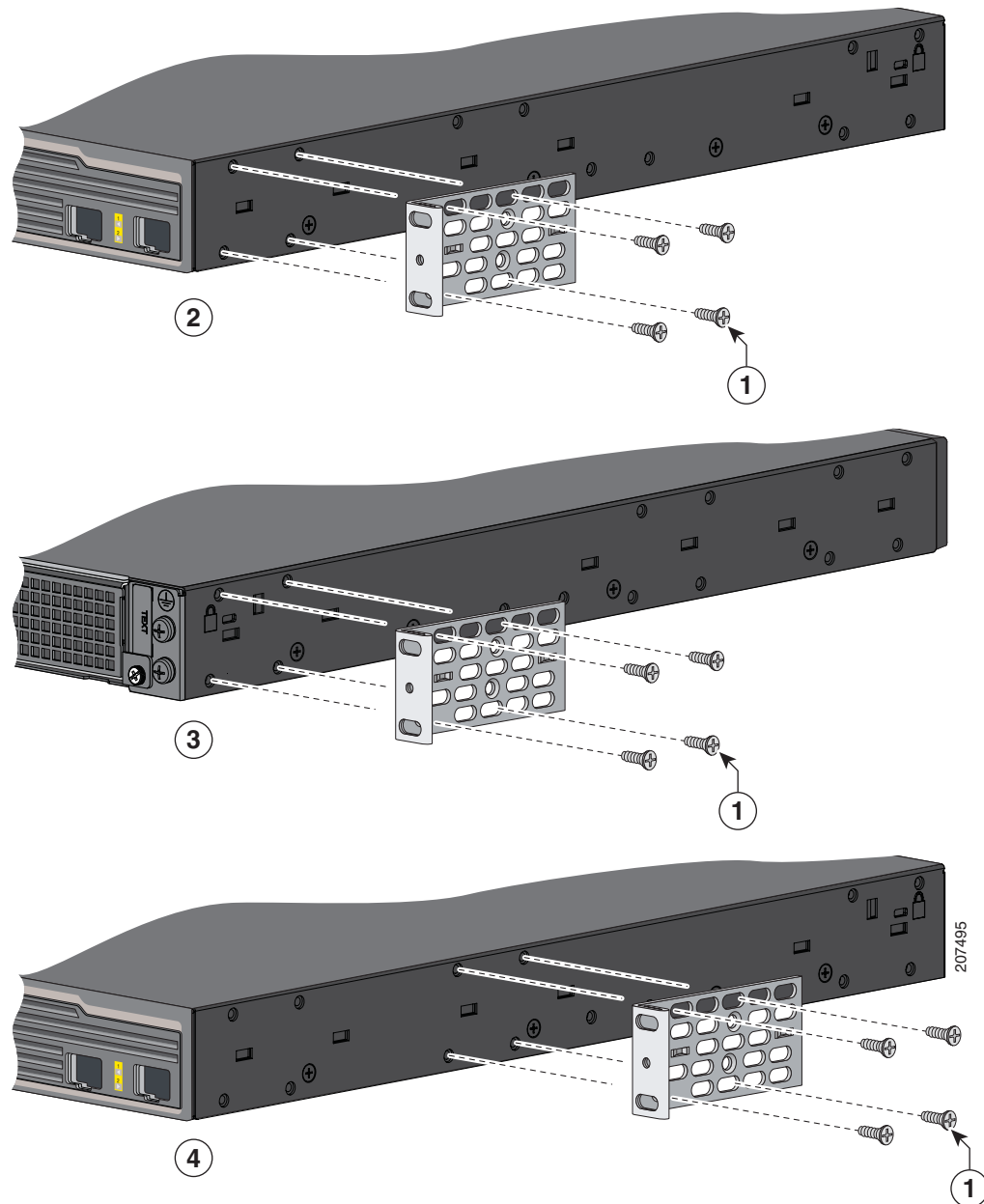
1	19-inch brackets	3	ETSI-rack brackets
2	23-inch brackets	4	23-inch angle brackets

- For 19-inch racks, use part number RCKMNT-ME3KX-19IN (see [Figure 2-2 on page 2-7](#)).
- For 23-inch racks, use part number RCKMNT-ME3KX-23IN (see [Figure 2-3 on page 2-8](#)).
- For ETSI racks, use part number RCKMNT-ME3KX-ETSI (see [Figure 2-4 on page 2-9](#)).
- For 23-inch racks using the angle bracket, use part number RCKMNT-ME3KX-ANG (see [Figure 2-5 on page 2-10](#)).

Attaching Brackets for 19-Inch Racks

Figure 2-2 shows how to attach brackets for 19-inch racks on the switch.

Figure 2-2 Attaching Brackets for 19-Inch Racks

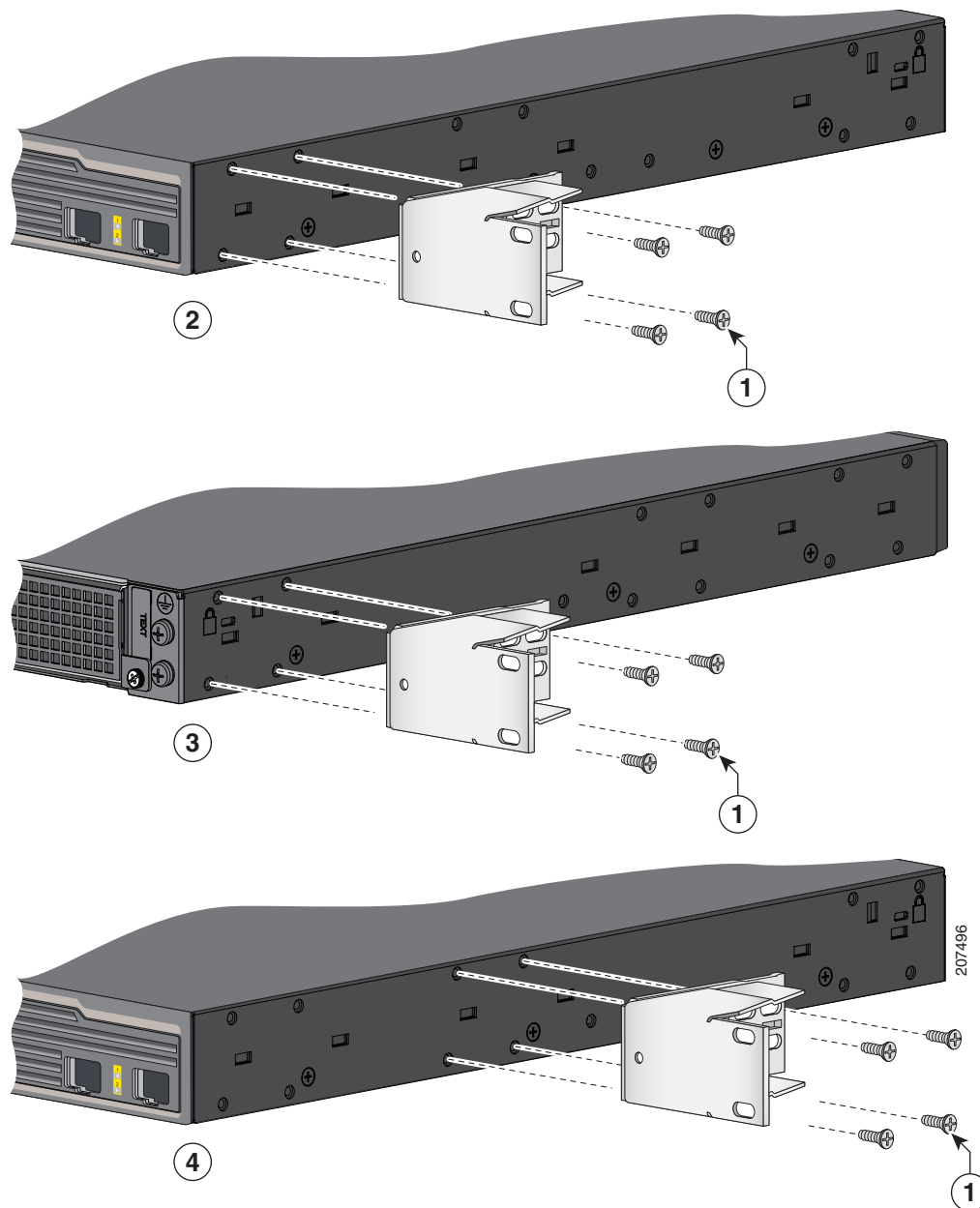


1	Phillips flat-head screws	3	Rear-mounting position
2	Front-mounting position	4	Mid-mounting position

Attaching Brackets for 23-Inch Racks

Figure 2-3 shows how to attach brackets for the 23-inch racks on the switch.

Figure 2-3 Attaching Brackets for 23-Inch Racks

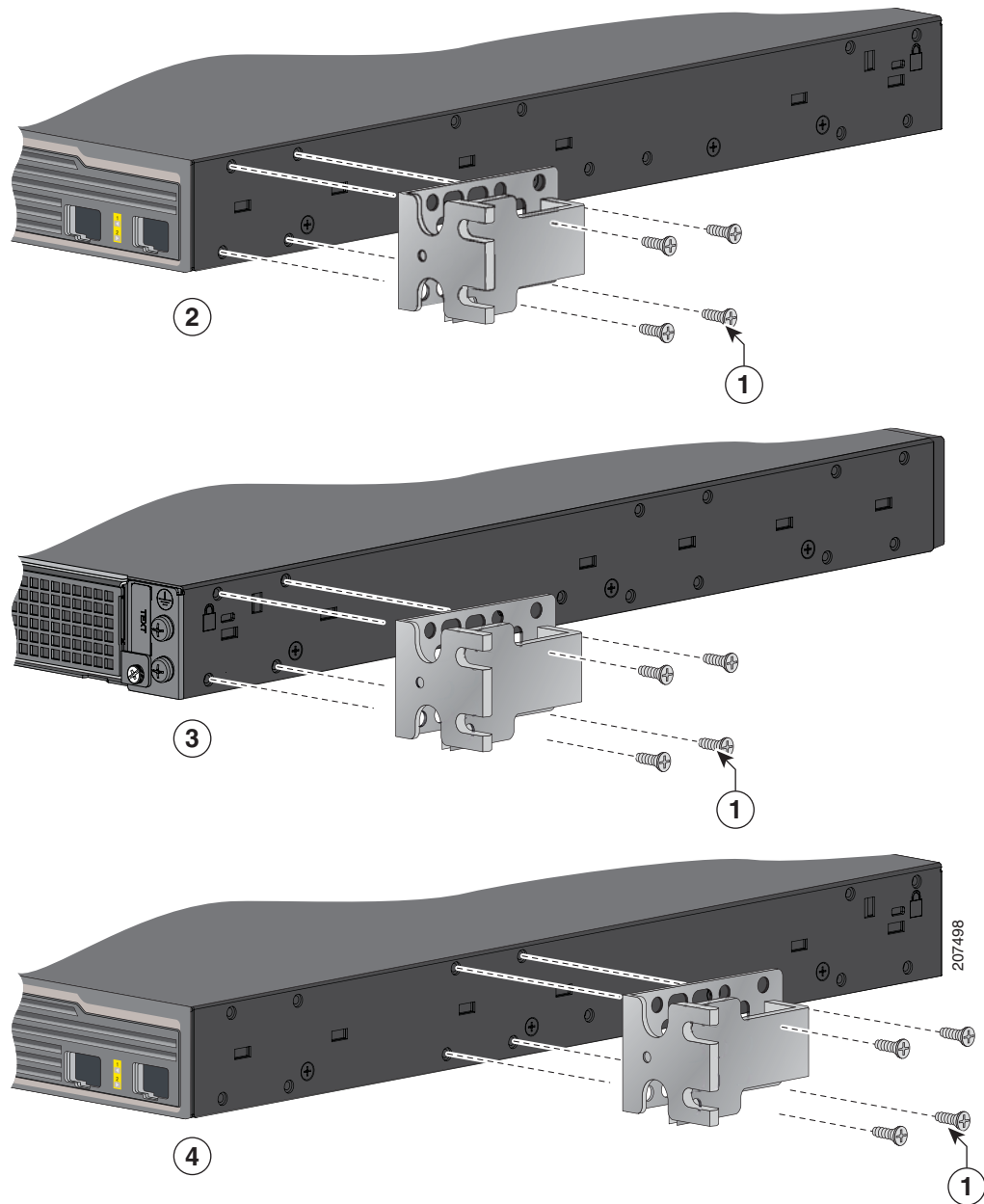


1	Phillips flat-head screws	3	Rear-mounting position
2	Front-mounting position	4	Mid-mounting position

Attaching Brackets for ETSI Racks

Figure 2-4 shows how to attach brackets for the ETSI racks on the switch.

Figure 2-4 Attaching Brackets for ETSI Racks



1	Phillips flat-head screws	3	Rear-mounting position
2	Front-mounting position	4	Mid-mounting position

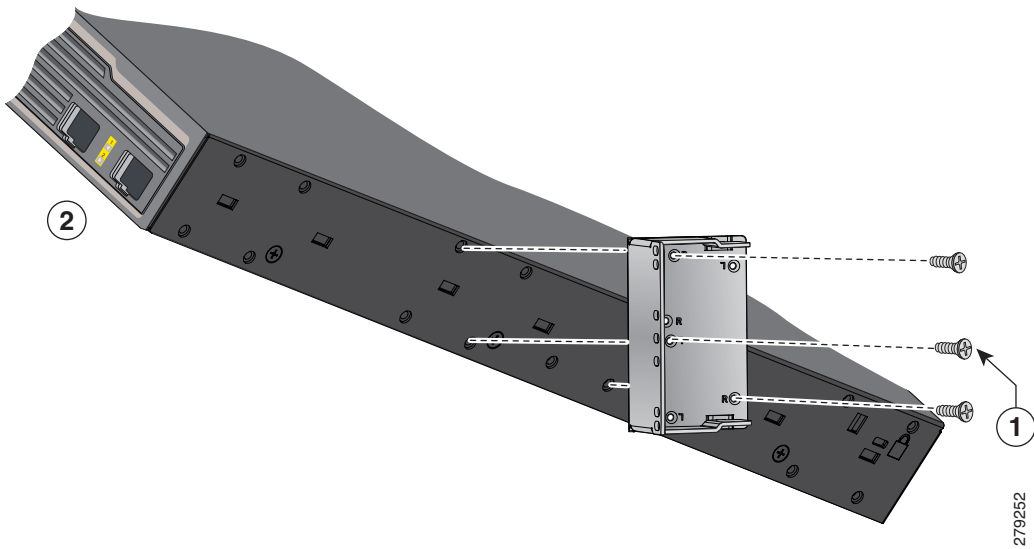
Attaching Angle Brackets for 23-Inch Racks

Figure 2-3 shows how to attach the angle brackets for 23-inch racks on the switch.


Note

Use the holes marked R to install the bracket on the right side; use the holes marked L to install the bracket on the left side.

Figure 2-5 *Attaching Angle Brackets for 23-Inch Racks*



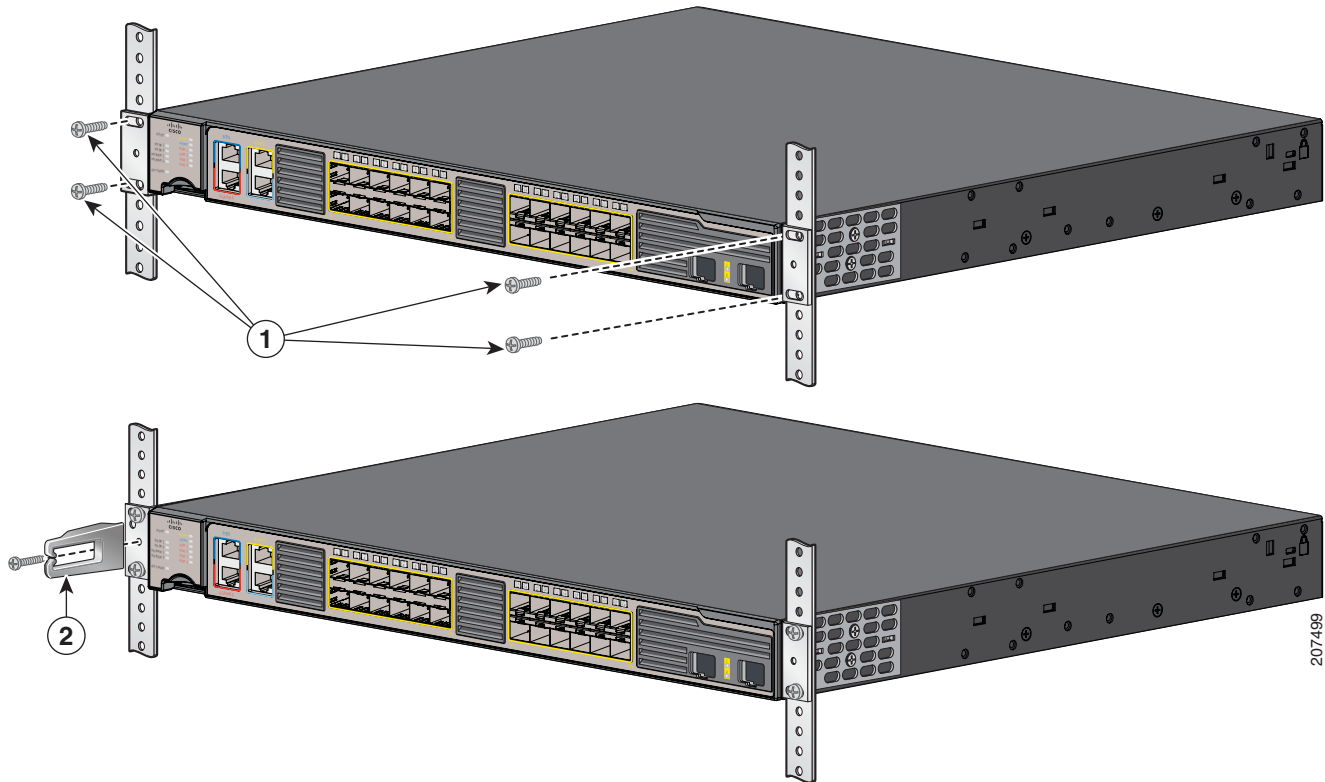
1	Phillips flat-head screws	2	Mid-mounting position
---	---------------------------	---	-----------------------

Mounting in a Rack

After the brackets are attached on the switch, use the four supplied number-12 Phillips machine screws to securely attach the brackets to the rack. See [Figure 2-6](#) for standard rack-mounting using the 19-inch, 23-inch, and ETSI brackets. See [Figure 2-7](#) for rack-mounting using the angle-bracket.

Mounting the Switch using 19-Inch, 23-Inch, and ETSI Brackets

Figure 2-6 Mounting the Switch



1	Phillips machine screws	2	Cable guide and screw
----------	-------------------------	----------	-----------------------

After the switch is mounted in the rack, you need to do these tasks to complete the installation:

- Power on the switch. See the [“Verifying Switch Operation”](#) section on page 2-4.
- Connect to the console port, and run the initial configuration. See the *Cisco ME 3800X and ME 3600X Switch Getting Started Guide* for instructions.
- Connect to the front-panel ports. See the [“Connecting to the 10/100/1000 Ports”](#) section on page 2-19 and the [“Connecting to Fiber-Optic SFP+ and SFP Modules”](#) section on page 2-20.
- We recommend attaching the cable guide to prevent the cables from obscuring the front panel of the switch and the other devices installed in the rack. Use the supplied black screw shown in [Figure 2-6](#) to attach the cable guide to the left or right bracket.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Mounting the Switch Using 23-Inch Angle Brackets

This warning applies to rack-mounted switches that use angle brackets:



Warning

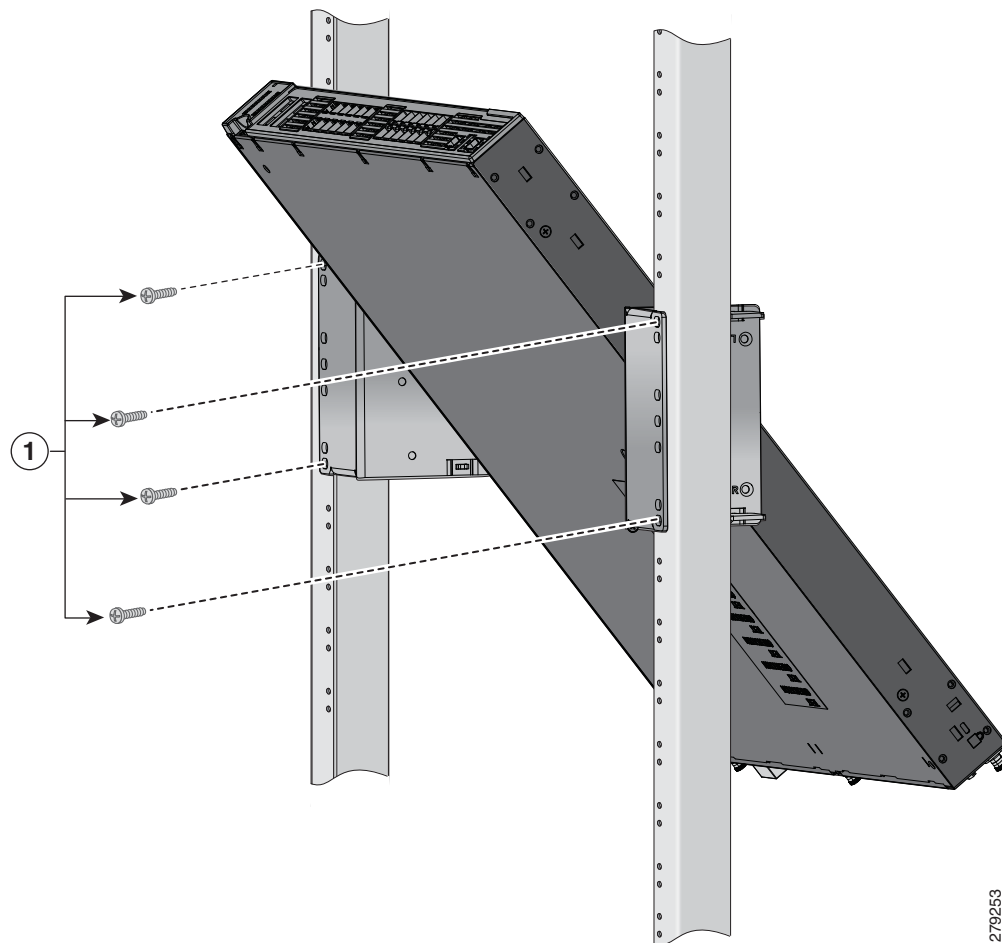
Suitable for mounting on and over a concrete or other non-combustible surface only. Statement 345



Note

The front of the switch extends approximately 5 inches from the front of the rack (including space for cables), and the rear of the switch extends approximately 10 inches into the rack.

Figure 2-7 *Mounting the Switch*



1	Phillips machine screws
----------	-------------------------

After the switch is mounted in the rack, you need to do these tasks to complete the installation:

- Power on the switch. See the [“Verifying Switch Operation”](#) section on page 2-4.
- Connect to the console port, and run the initial configuration. See the *Cisco ME 3800X and ME 3600X Switch Getting Started Guide* for instructions.
- Connect to the front-panel ports. See the [“Connecting to the 10/100/1000 Ports”](#) section on page 2-19 and the [“Connecting to Fiber-Optic SFP+ and SFP Modules”](#) section on page 2-20.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Wall-Mounting

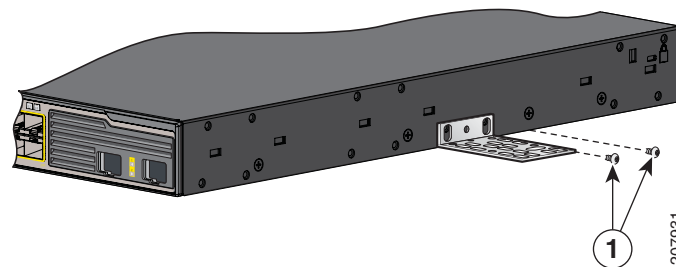
- [Attaching Brackets for Wall-Mounting](#), page 2-13
- [Mounting the Switch on a Wall](#), page 2-14

**Note**

Wall-mounting is not supported for NEBS applications.

Attaching Brackets for Wall-Mounting

Figure 2-8 Attaching 19-inch Bracket to Wall-Mount Cisco ME 3800X



1	Phillips truss-head screws
----------	----------------------------

Follow the same steps to attach the second bracket to the opposite side.

Mounting the Switch on a Wall

For the best support of the switch and cables, make sure that the switch is attached securely to wall studs or to a firmly attached plywood mounting backboard.

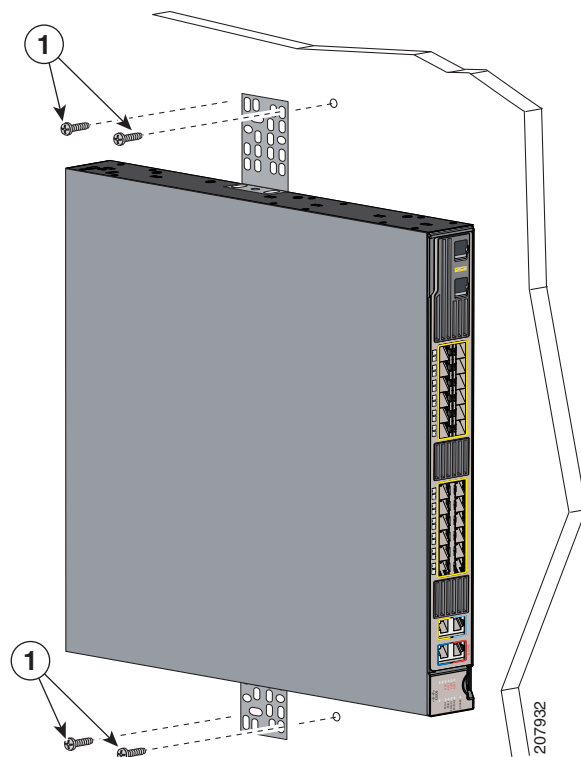


Warning

Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378

Mount the switch with the side panel facing up (Figure 2-9).

Figure 2-9 Mounting Cisco ME 3800X on a Wall



1	User-supplied screws
----------	----------------------

You need to do these tasks to complete the installation:

- Power on the switch. See the [“Verifying Switch Operation”](#) section on page 2-4.
- Connect to the console port, and run the initial configuration. See the *Cisco ME 3800X and ME 3600X Switch Getting Started Guide* for instructions.
- Connect to the front-panel ports. See the [“Connecting to the 10/100/1000 Ports”](#) section on page 2-19 and the [“Connecting to Fiber-Optic SFP+ and SFP Modules”](#) section on page 2-20.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Table- or Shelf-Mounting

Follow these steps to install the switch on a table or a shelf:

-
- Step 1** Place the switch on a table or a shelf near an AC power source.
- Step 2** After the switch is placed on the table or shelf, you need to do these tasks to complete the installation:
- Power on the switch. See the [“Verifying Switch Operation”](#) section on page 2-4.
 - Connect to the console port, and run the initial configuration. See the *Cisco ME 3800X and ME 3600X Switch Getting Started Guide* for instructions.
 - Connect to the front-panel ports. See the [“Connecting to the 10/100/1000 Ports”](#) section on page 2-19 and the [“Connecting to Fiber-Optic SFP+ and SFP Modules”](#) section on page 2-20.
-

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

**Note**

When the connectors are not being used, replace the dust covers on them for protection.

Installing and Removing SFP+ and SFP Modules

Installing SFP+ and SFP Modules

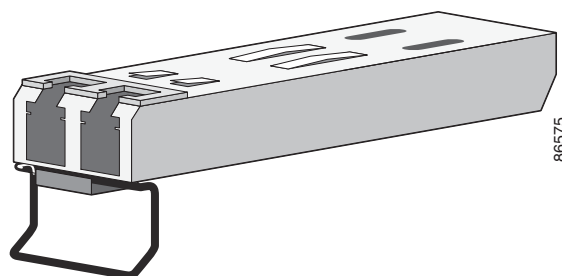
[Figure 2-10](#) shows an SFP+ module that has a bale-clasp latch.

**Caution**

We strongly recommend that you do not install or remove fiber-optic SFP+ or SFP modules with cables attached because of the potential damage to the cables, the cable connector, or the optical interfaces in the SFP+ or SFP module. Disconnect all cables before removing or installing an SFP+ or SFP module.

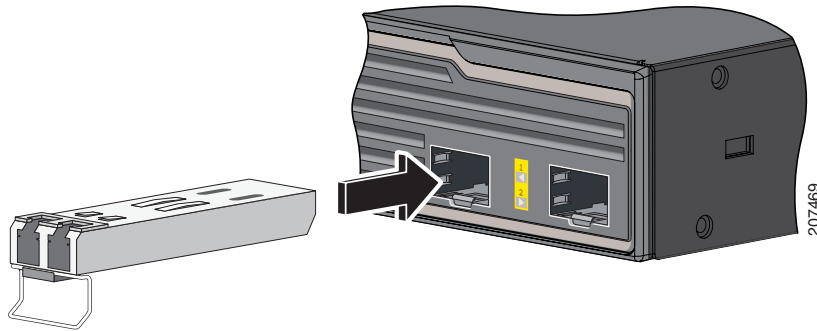
Removing and installing an SFP+ or SFP module can shorten its useful life. Do not remove and insert SFP+ or SFP modules more often than is absolutely necessary.

Figure 2-10 SFP+ Module with a Bale-Clasp Latch



-
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
- Step 2** Find the send (TX) and receive (RX) markings that identify the top side of the SFP+ or SFP module.
- On some SFP+ and SFP modules, the send and receive (TX and RX) markings might be replaced by arrows that show the direction of the connection, either send or receive (TX or RX).
- Step 3** Align the SFP+ or SFP module in front of the slot opening and push until you feel the connector on the module snap into place in the rear of the slot (see [Figure 2-11](#)).

Figure 2-11 Installing an SFP+ Module into an SFP+ Module Slot



- Step 4** For fiber-optic SFP+ or SFP modules, remove the dust plugs from the optical ports, and store them for later use.



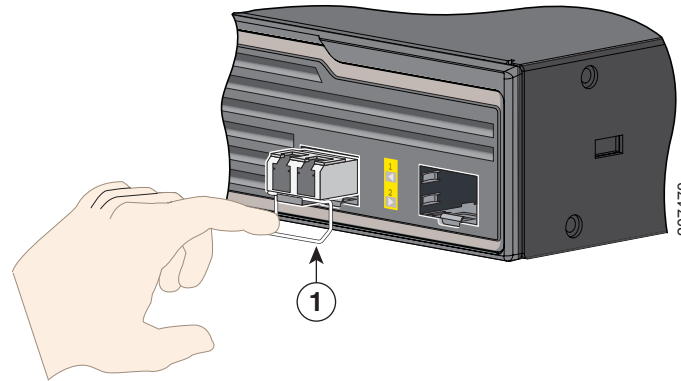
Caution

Do not remove the dust plugs from the fiber-optic SFP+ or SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP+ or SFP module ports and cables from contamination and ambient light.

- Step 5** Insert the LC or MT-RJ cable connector into the SFP+ or SFP module.
-

Removing SFP+ or SFP Modules

-
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
- Step 2** Disconnect the cable from the SFP+ or SFP module. For reattachment, note which cable connector plug is send (TX) and which is receive (RX).
- Step 3** Insert a dust plug into the optical ports of the SFP+ or SFP module to keep the optical interfaces clean.
- Step 4** Pull the bale out and down to eject the module.

Figure 2-12 Removing a Bale-Clasp Latch SFP+ Module

1	Bale clasp
----------	------------

- Step 5** Grasp the SFP+ or SFP module, and carefully remove it from the module slot.
- Step 6** For fiber-optic SFP+ or SFP modules, insert a dust plug into the optical ports of the SFP+ or SFP module to keep the optical interfaces clean.
- Step 7** Place the removed SFP+ or SFP module in an antistatic bag or other protective environment.

Inserting and Removing the SFP+ Module Patch Cable



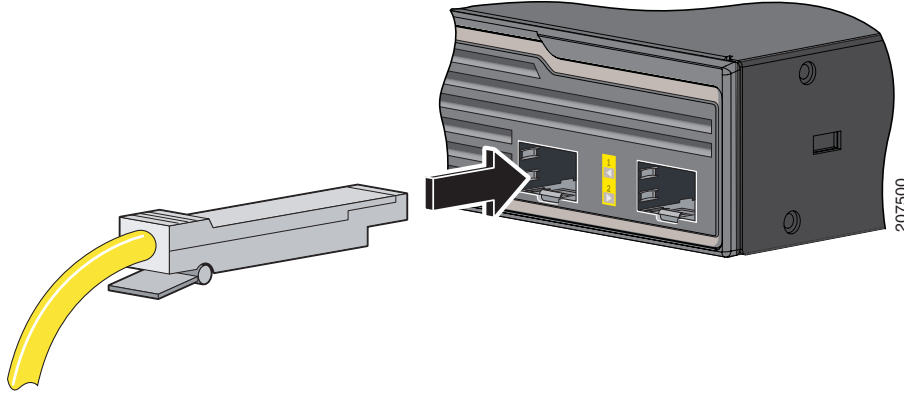
Note

This section shows how to install and remove an SFP+ module patch cable into an SFP+ (uplink) module slot. The procedure is the same for installing an SFP module patch cable into an SFP (downlink) module slot.

To insert an SFP+ module patch cable into the SFP+ module slot, follow these steps:

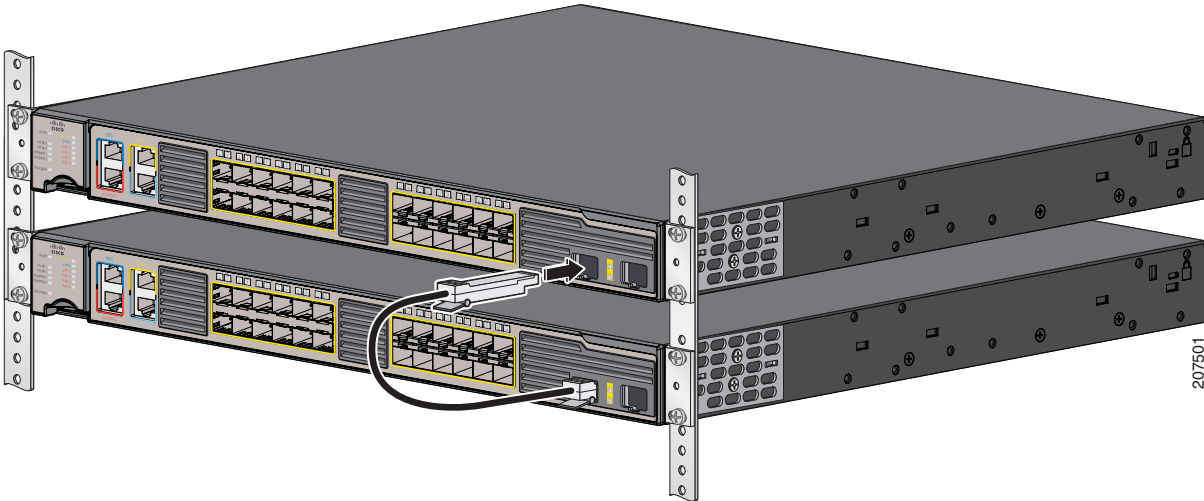
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
- Step 2** Insert the SFP+ module patch cable into the slot until you feel the connector on the cable snap into place in the rear of the slot (see [Figure 2-13](#)).

Figure 2-13 Inserting an SFP+ Module Patch Cable into an SFP+ Module Slot



Step 3 Repeat these steps for the second switch to which you want to connect the first switch.

Figure 2-14 Connecting Two Switches with an SFP+ Module Patch Cable



To remove an SFP+ module patch cable from the SFP+ module slot, release the connector, and pull it from the SFP+ module slot.

Connecting to the 10/100/1000 Ports

The switch 10/100/1000 ports configure themselves to operate at the speed of attached devices. If the attached ports do not support autonegotiation, you can explicitly set the speed and duplex parameters. Connecting devices that do not autonegotiate or that have their speed and duplex parameters manually set can reduce performance or result in no linkage.

To maximize performance, choose one of these methods for configuring the Ethernet ports:

- Let the ports autonegotiate both speed and duplex.
- Set the port speed and duplex parameters on both ends of the connection.

Follow these steps to connect to 10BASE-T, 100BASE-TX, or 1000BASE-T devices:

- Step 1** When connecting to workstations, servers, and routers, connect a straight-through cable to an RJ-45 connector on the front panel. (See [Figure 2-15](#).) When connecting to switches or repeaters, use a crossover cable. (See the “[Cables and Adapters](#)” section on [page B-5](#) for cable-pinout descriptions.)

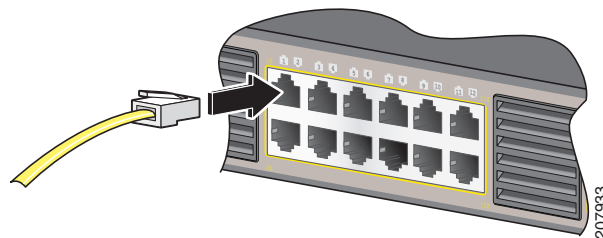


Note

You can use the **mdix auto** interface configuration command in the CLI to enable the automatic medium-dependent interface crossover (auto-MDIX) feature. The switch then detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100/1000 or 1000BASE-T SFP module port on the switch, regardless of the type of device on the other end of the connection.

- Step 2** Connect the other end of the cable to an RJ-45 connector on the other device. The port LED turns on when both devices have established link. (See [Figure 2-15](#).)

Figure 2-15 Connecting to an Ethernet Port



The port LED is amber while Spanning Tree Protocol (STP) discovers the topology and searches for loops. This takes about 30 seconds, and then the port LED turns green. If the port LED does not turn green, the device at the other end might not be turned on, or there might be a cable problem or a problem with the adapter installed in the attached device. See [Chapter 4, “Troubleshooting,”](#) for solutions to cabling problems.

- Step 3** Reconfigure and reboot the connected device, if necessary.
- Step 4** Repeat Steps 1 through 3 to connect each device.

Connecting to Fiber-Optic SFP+ and SFP Modules

**Warning**

Class 1 laser product. Statement 1008

**Caution**

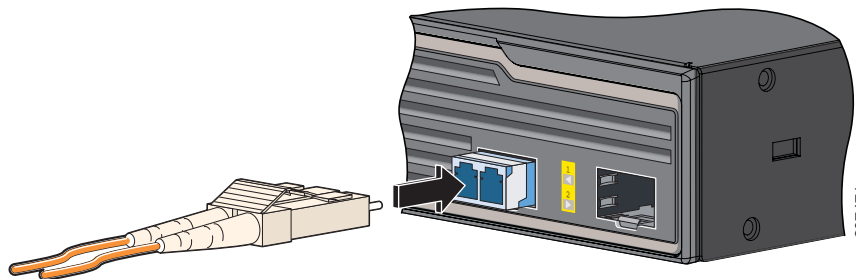
Do not remove the rubber plugs from the SFP+ or SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP+ or SFP module ports and cables from contamination and ambient light.

Before connecting to the SFP+ or SFP module, be sure that you understand the port and cabling stipulations in the [“Installation Guidelines”](#) section on page 2-4 and in the [“SFP+ and SFP Modules”](#) section on page 1-4. See [Appendix B, “Connector and Cable Specifications,”](#) for information about the LC on the SFP+ or SFP module.

Step 1 Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.

Step 2 Insert one end of the fiber-optic cable into the SFP+ or SFP module port (see [Figure 2-16](#)).

Figure 2-16 Connecting to a Fiber-Optic SFP Module Port



Step 3 Insert the other cable end into a fiber-optic connector on a target device.

Step 4 Observe the port status LED.

The LED turns green when the switch and the target device have an established link.

The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.

If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be problem with the adapter installed in the target device. See [Chapter 4, “Troubleshooting,”](#) for solutions to cabling problems.

Step 5 If necessary, reconfigure and restart the switch or target device.

Where to Go Next

You can use the default configuration or use any of the management options described in the [“Management Options”](#) section on page 1-13 to change the switch settings.



CHAPTER 3

Installing and Removing AC and DC Input Power Supply and Fan Modules

This chapter provides the installation and removal instructions for the AC and DC input power supply and fan modules for the Cisco ME 3800X and ME 3600X switches. Your switch ships with at least one power supply module installed, either AC or DC, depending on your order. The power supply and fan modules are field-replaceable units (FRUs).



Note

The power supply and fan modules are hot-swappable devices.

For translations of the safety warnings in this chapter, see the *Regulatory Compliance and Safety Information for the Cisco ME 3800X and ME 3600X Switch* on Cisco.com.

- [Power Supply Module Description, page 3-1](#)
- [Fan Module Description, page 3-3](#)
- [Connector-Side Description, page 3-3](#)
- [Power Supply and Fan Module Installation, page 3-4](#)

Power Supply Module Description

Table 3-1 Power Supply Module Model Numbers and Descriptions

Model number	Description
PWR-ME3KX-AC	AC input power supply module
PWR-ME3KX-DC	DC input power supply module

The AC input power supply module is an autoranging unit that supports input voltages between 100 and 240 VAC. The AC power supply module ships with a power cord to connect to an AC power outlet.

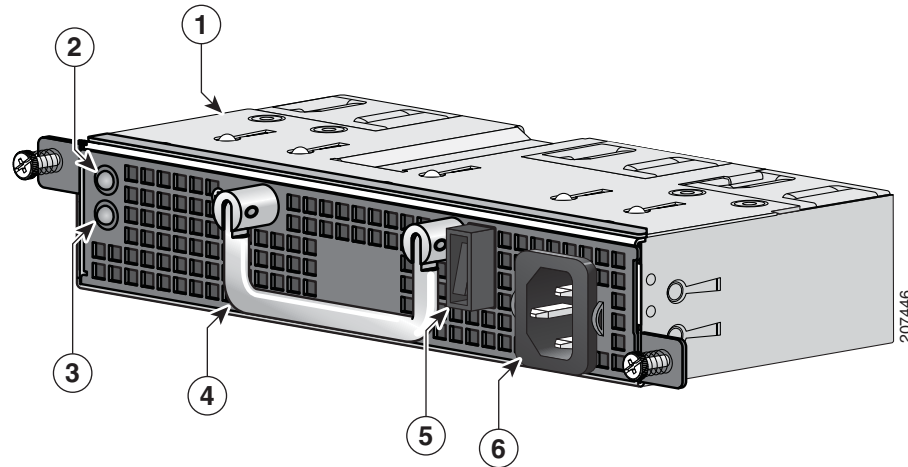
The DC input power supply module has a single input feed and supports input voltages from 18 to 32 VDC or 36 to 72 VDC. The DC power supply module ships with a terminal block to be wired for DC power outlet connections. The terminal block is covered by a clear plastic block cover that snaps onto the terminal block. You must remove the block cover before you work with the wires. The block cover is slotted so that the wires can exit only one end. If you want the wires to exit in a different direction, remove the block cover, rotate it, and snap it back on.

Each power supply module is cooled by three internal fans. A fan failure triggers an alarm. When a fan fails, replace the power supply module immediately.

**Caution**

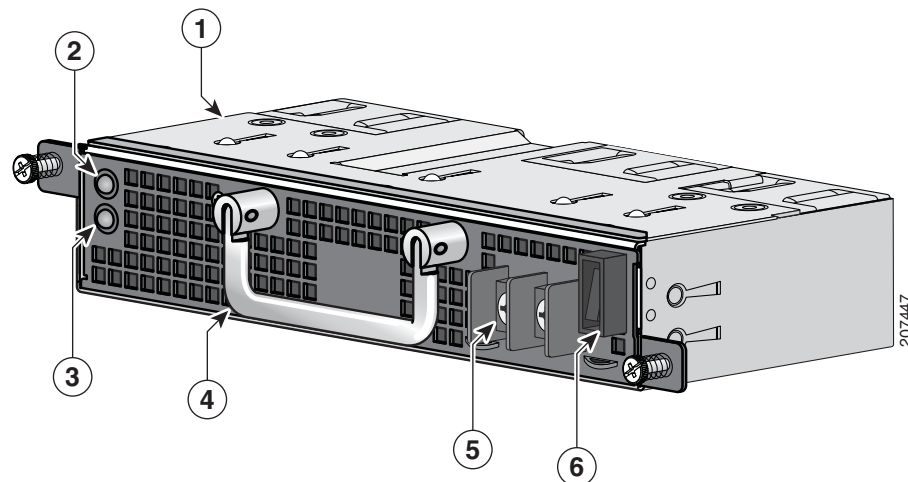
Both slots must be occupied either by two power supply modules or a power supply and a fan module. Do not run the switch with an empty slot unless you are replacing a faulty power supply or fan module. Running the switch with an empty slot triggers an alarm.

Figure 3-1 AC Input Power Supply Module Handle Side



1	AC input power supply module	4	Extraction handle
2	Power supply module LED	5	Power switch
3	Power input LED	6	AC power connector

Figure 3-2 DC Input Power Supply Module Handle Side



1	DC input power supply module	4	Extraction handle
2	Power supply module LED	5	DC input power terminal block
3	Power input LED	6	Power switch

Fan Module Description

Table 3-2 Fan Module Model Number and Description

Model number	Description
ME-FANTRAY	Fan module

The fan module provides cooling and proper airflow when only one power supply module is installed.

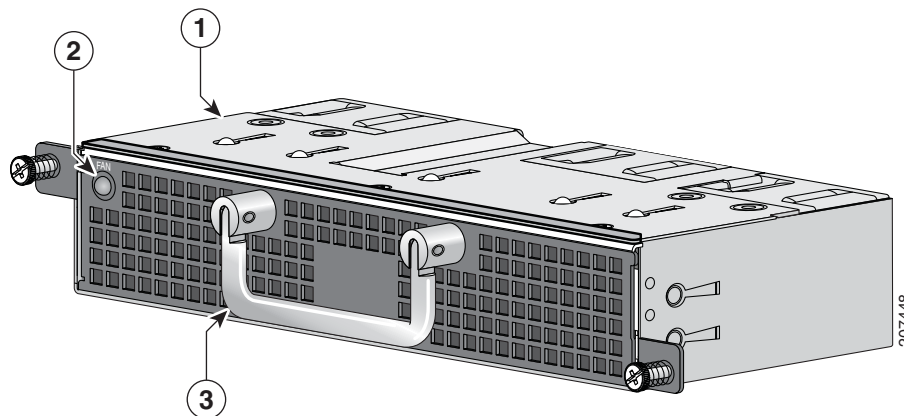


Caution

Both slots must be occupied either by two power supply modules or a power supply and a fan module. Do not run the switch with an empty slot unless you are replacing a faulty power supply or fan module. Running the switch with an empty slot triggers an alarm.

Each fan module contains three fans. The switch can operate safely if one fan fails. A fan failure triggers an alarm. When a fan fails, replace the fan module immediately.

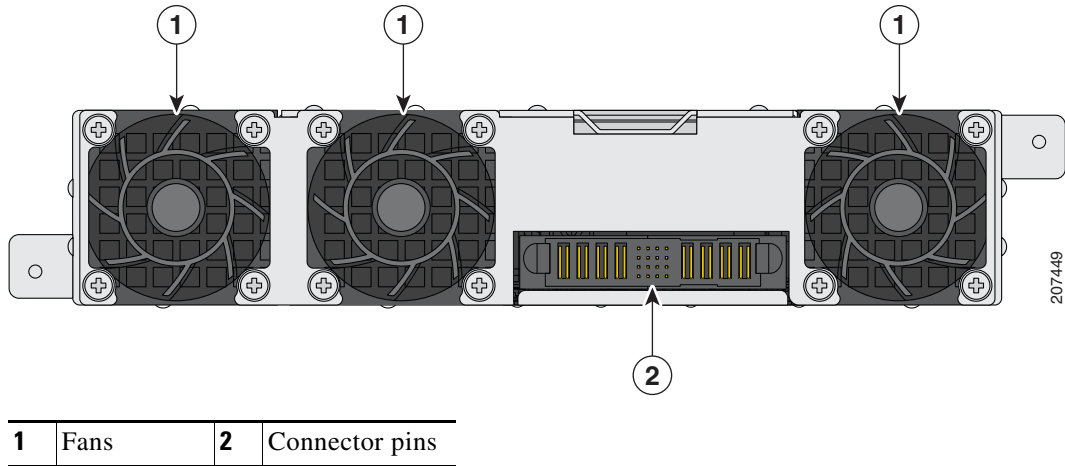
Figure 3-3 Fan Module Handle Side



1	Fan module	3	Extraction handle
2	Fan module status LED		

Connector-Side Description

Figure 3-4 shows the connector side of the power supply and fan module, which connects to the switch rear panel through its power supply module slot.

Figure 3-4 Power Supply and Fan Module Connector Side

Power Supply and Fan Module Installation

- [Equipment That You Supply](#), page 3-4
- [Installation Guidelines](#), page 3-4
- [Installing an AC Power Supply Module](#), page 3-5
- [Installing a DC Power Supply Module](#), page 3-7
- [Installing a Fan Module](#), page 3-13

Equipment That You Supply

You need a ratcheting screwdriver with a Phillips head that exerts up to 15 inch-pounds (in-lb) of torque.

Installation Guidelines

Observe these guidelines when you install a fan or power supply module:

- Do not force the fan or power supply module into the slot. This can damage the pins on the switch if they are not aligned with the unit.
- A fan or power supply module that is only partially connected to the switch can disrupt the system operation.
- Verify that you are using the correct power cord.



Warning

Do not reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard. Statement 206



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

**Warning**

Do not work on the system or connect or disconnect cables during periods of lightning activity.

Statement 1001

**Caution**

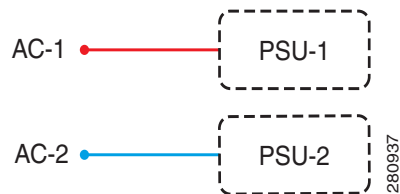
To prevent overheating and to maintain proper air flow, either a power supply module or a fan module must be installed in each power supply module slot at all times. Never operate the switch for extended periods of time without either a power supply module or a fan module installed in each power supply module slot.

Installing an AC Power Supply Module

This procedure is for installing an AC power supply module in the PSU 1 power supply module slot. Repeat these steps to install a power supply module in the PSU 2 power supply module slot.

Each AC power input is dedicated to one power supply module (PSU 1 or PSU 2). One AC power input does not power on both power supply modules at the same time (see [Figure 3-5](#)).

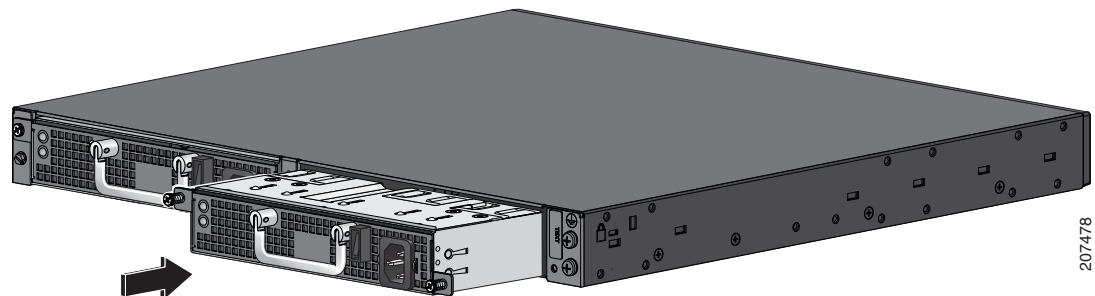
Figure 3-5 AC Power Supply Diagram



To install an AC input power supply module, follow these steps:

- Step 1** Verify that the power from the power source is off.
- Step 2** Insert the new power supply module in the power supply module slot, and gently push it into the slot (see [Figure 3-6](#)). When correctly inserted, the power supply module is flush with the switch rear panel.

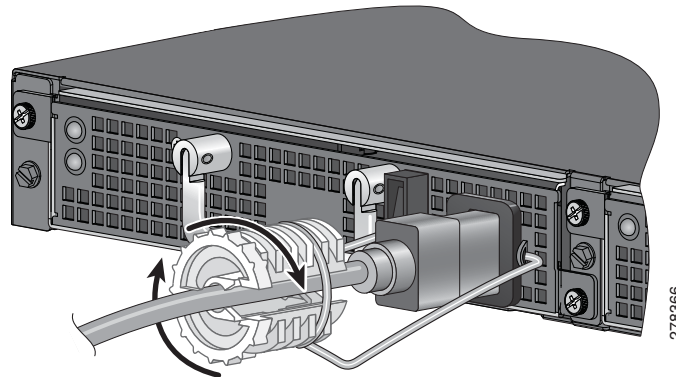
Figure 3-6 Inserting an AC Power Supply Module in a Switch



- Step 3** Align the two captive screws with the screw holes in the panel. Use a ratcheting torque screwdriver to torque each screw to 10 in-lb.
- Step 4** Connect the AC power cord to the power supply module and to an AC power outlet.

- Step 5** (Optional) Attach the power-cord retainer clip to the power supply module and thread the plastic bushing until it is snug against the plug ([Figure 3-7](#)).

Figure 3-7 AC Power Supply Module and Power-Cord Retainer in a Switch



- Step 6** Turn on the power at the power source and set the power supply module switch to ON.
- Step 7** From the front of the switch, confirm that the PS IN and the PS/FAN LEDs are green. If you can access the switch rear panel, verify that the PSU and INPUT LEDs are green. See the [“Power Supply Module LEDs”](#) section on page 1-11 for a description of the power supply module LEDs. See the [“Switch LED Panels”](#) section on page 1-7 for system LED descriptions.

Removing AC Power Supply Modules

- Step 1** Turn off the power at its source, and set the power supply module switch to OFF.
- Step 2** Detach the power-cord retainer and the plastic bushing from the power cord.
- Step 3** Remove the power cord from the power connector.
- Step 4** Use a Phillips screwdriver to loosen the two captive screws that secure the power supply module to the chassis.



Caution

Do not leave the power supply slot open for more than:

- 5 minutes provided the ambient temperature is 25°C and at 5000 feet or lower elevation
- 90 seconds in all other conditions.



Caution

Wait 5 minutes prior to reopening a power supply slot.

- Step 5** Remove the power supply module from the power slot by pulling on the extraction handle.

Installing a DC Power Supply Module

This procedure is for installing an DC power supply module into the PSU 1 power supply module slot. Repeat these steps to install a power supply module in the PSU 2 power supply slot.

To connect the switch to a DC input power source, follow these steps:

1. [Preparing for Installation, page 3-7](#)
2. [Grounding the Switch, page 3-8](#)
3. [Installing the DC Power Supply Module in the Switch, page 3-10](#)
4. [Wiring the DC Input Power Source, page 3-10](#)

**Warning**

An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the terminal block plug.

Statement 122

**Warning**

Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position. Use a voltmeter to test for 0 (zero) voltage at the power terminals on the chassis. Statement 196

**Caution**

Installation of the equipment must comply with local and national electrical codes.

**Note**

We recommend that you use 14 or 16 AWG copper wiring for Network Equipment Building Systems (NEBS) installation, following the guidelines for DC power wiring in the central office.

**Note**

You can use the grounding lug to attach a wrist strap for ESD protection during servicing.


Preparing for Installation

You need these tools and equipment:


- Ratcheting torque Phillips-head screwdriver that exerts up to 36 inch-pounds (in-lb).
- Crimping tool
- Wire-stripping tools.
- Copper ground wire (6 AWG, insulated or noninsulated) for the ground connection.
- Two leads of 14 or 16 AWG copper wire.

Grounding the Switch


Follow the grounding procedure instructions and observe these warnings:


Warning

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024


Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

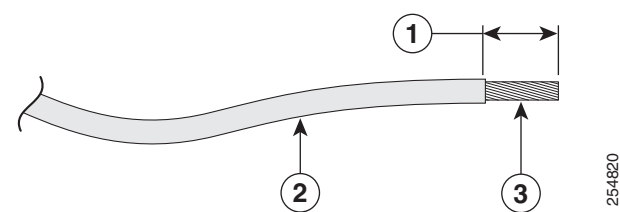

Caution

To make sure that the equipment is reliably connected to earth ground, follow the grounding procedure instructions, and use a UL-listed lug suitable for number-6 AWG wire and two number-10-32 ground-lug screws.

Follow these steps to install a dual-ground lug on the switch. Make sure to follow any grounding requirements at your site.

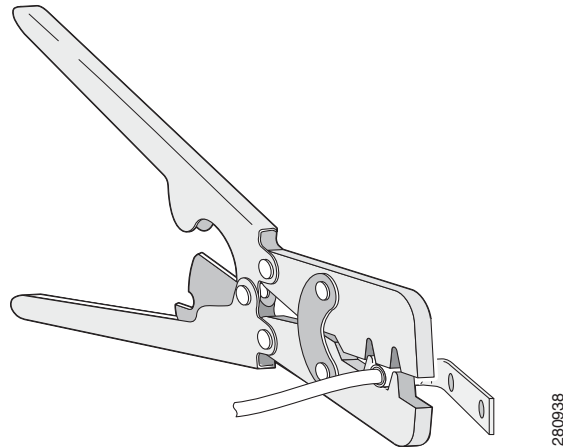
- Step 1
- Locate the dual-hole lug that ships with the switch.
- Step 2
- If your ground wire is insulated, use a wire stripping tool to strip the 6 AWG ground wire to 0.875 inch (12.7 mm) ± 0.02 inch (0.5 mm).

Figure 3-8 Stripping the Ground Wire

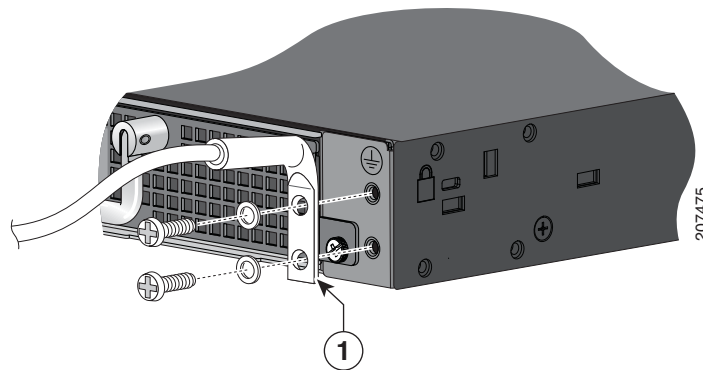


1	0.875 inch (12.7 mm) ± 0.02 inch (0.5 mm)	3	Wire lead
2	Insulation		

- Step 3
- Slide the open end of the ground lug over the exposed area of the wire.
- Step 4
- Crimp the ground lug to the wire (see [Figure 3-9](#)).

Figure 3-9 Crimping the Ground Lug

- Step 5** Attach the dual-hole lug and the wire assembly to the chassis ground connection with the supplied screws (Figure 3-10).

Figure 3-10 Attaching the Ground Lug and Wire Assembly

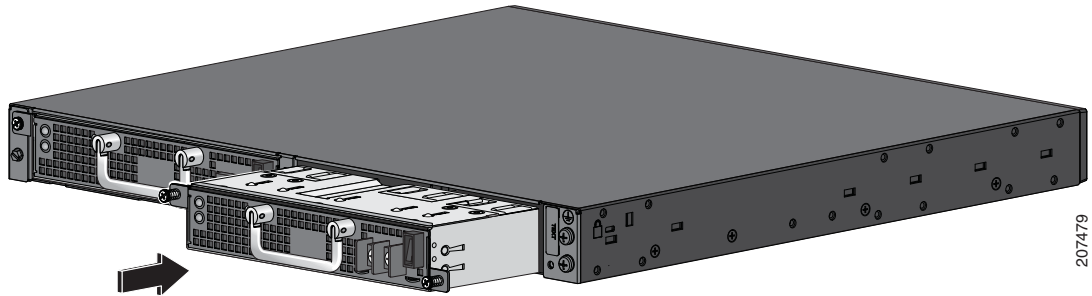
1	Dual-hole ground lug
----------	----------------------

- Step 6** Use a ratcheting torque Phillips-head screwdriver to torque the ground-lug screws to 32 in-lb.
- Step 7** Connect the other end of the grounding wire to an appropriate grounding point at your site or to the rack.

Installing the DC Power Supply Module in the Switch

- Step 1** To ensure that power is removed from the DC circuits, locate the circuit breakers for the DC circuits, switch the circuit breakers to the OFF position, and tape the circuit-breaker switches in the OFF position.
- Step 2** Insert the new power supply module into the power supply module slot, and gently push it into the slot (Figure 3-11). When correctly inserted, the power supply module is flush with the switch rear panel.

Figure 3-11 Inserting a DC Power Supply Module



- Step 3** Align the two captive screws with the screw holes. Use a ratcheting torque Phillips-head screwdriver to torque each screw to 10 in-lb.
- Step 4** Connect the input power as described in the “Wiring the DC Input Power Source” section.

Wiring the DC Input Power Source

Before you wire the DC input power source, review these warnings and the information:



Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than:

24VDC – 30A

48VDC – 15A Statement 1005



Warning

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.

Statement 1022



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Statement 1030



Caution

The DC power supply module voltage should be within 18 to 32 VDC or 36 to 72 VDC. If the supply voltage is not in this range, the switch might not operate properly or might be damaged.

Step 1 To ensure that all power is OFF, locate the circuit breaker that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

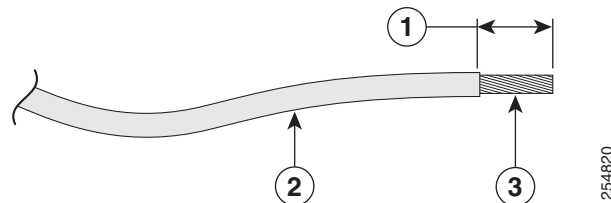
Step 2 Remove the terminal block cover.



Note The terminal block is covered by a clear plastic block cover that snaps onto the terminal block. You must remove the block cover before you work with the wires. The block cover is slotted so that the wires can exit only one end. If you want the wires to exit in a different direction, remove the block cover, rotate it, and snap it back on.

Step 3 Using a wire-stripping tool, strip each of the wires coming from the DC input power source to 0.350 inch (8.9 mm) \pm 0.02 inch (0.5 mm).

Figure 3-12 Stripping the DC Input Power Source Wire

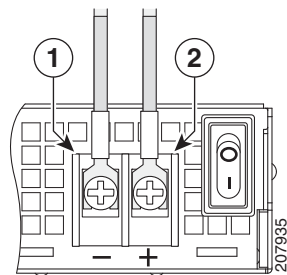


1	0.350 inch (8.9 mm) \pm 0.02 inch (0.5 mm)	3	Wire lead
2	Insulation		

Step 4 Crimp the fork-type terminals to the 14 or 16 AWG DC power input wires.

Step 5 Connect the wires to the DC input power terminals as shown in [Figure 3-13](#). Make sure to match the polarity (negative to negative, positive to positive) when connecting the wires to the terminal.

Figure 3-13 Connecting the DC Input Power Terminals to the Terminal Blocks



1	Negative	2	Positive
----------	----------	----------	----------

Step 6 Use a ratcheting torque Phillips-head screwdriver to torque the terminal-block screw to 14 in-lb.



Caution Do not overtorque the terminal-block screws. The recommended maximum torque is 14 in-lb.

**Caution**

Secure the wires coming from the terminal block so that they cannot be disturbed. For example, use tie wraps to secure the wires to the rack.

-
- Step 7** After ensuring that all wire connections are secure, reinstall the terminal block cover.
- Step 8** Remove the tape from the circuit-breaker switch handle, and move the circuit-breaker handle to ON.
- Step 9** Move the DC power supply module switch to ON.
- Step 10** From the front of the switch, confirm that the PS IN and the PS/FAN LEDs are green. If you can access the switch rear panel, verify that the power supply module PSU and INPUT LEDs are green. See the [“Power Supply Module LEDs” section on page 1-11](#) for a description of the power supply module LEDs. See the [“Switch LED Panels” section on page 1-7](#) for system LED descriptions
-

Removing the DC Power Supply Module

-
- Step 1** Move the DC power supply module switch to OFF.
- Step 2** Turn off power at the DC circuits. To ensure that power is removed from the DC circuits, locate the circuit breakers for the DC circuits, switch the circuit breakers to OFF, and tape the circuit-breaker switches.
- Step 3** Remove the terminal block cover from the power supply module terminal blocks.
- Step 4** Use a Phillips screwdriver to remove the DC input power wires from the power terminals.
- Step 5** Use a Phillips screwdriver to loosen the two captive screws that secure the power supply module to the switch chassis.
- Step 6** Remove the power supply module from the power slot by pulling on the extraction handle.
-

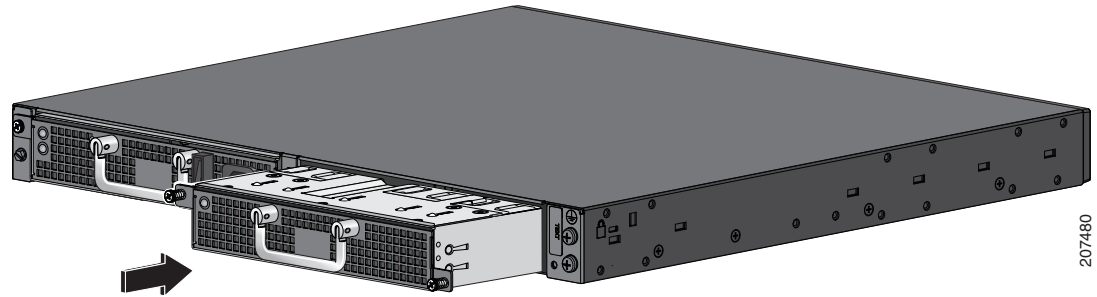
**Caution**

To prevent overheating and to maintain proper air flow, either a power supply module or a fan module must be installed in each power supply module slot at all times.

Installing a Fan Module

- Step 1** Insert the new fan module in the power supply module slot, and gently push it into the slot (Figure 3-14). When correctly inserted, the fan module is flush with the switch rear panel.

Figure 3-14 Inserting a Fan Module in a Switch



- Step 2** Align the two captive screws with the screw holes in the panel. Use a ratcheting torque screwdriver to torque each screw to 10 in-lb.
- Step 3** From the front of the switch, confirm that the PS/FAN LED is green. If you can access the switch rear panel, verify that the FAN LED is green. See the “[Fan Module LED](#)” section on page 1-13 for a description of the fan module LED. See the “[Switch LED Panels](#)” section on page 1-7 for system LED descriptions.



CHAPTER 4

Troubleshooting

- [Diagnosing Problems, page 4-1](#)
- [Clearing the Switch IP Address and Configuration, page 4-4](#)
- [Finding the Switch Serial Number, page 4-5](#)

Diagnosing Problems

The LEDs on the front panel provide troubleshooting information about the switch. They show power-on self-test (POST) failures, port-connectivity problems, and overall switch performance. You can also get statistics from the CLI or from an SNMP workstation. See the software configuration guide and the switch command reference on Cisco.com or the documentation that came with your SNMP application for more information.

Switch POST Results

As the switch powers on, it begins the POST, a series of tests that runs automatically to ensure that the switch functions properly. It might take several minutes for the switch to complete POST.

When the switch begins POST, the System LED blinks green, and the other LEDs remain green. When POST succeeds, the System LED becomes green. The other LEDs turn off and return to their operating status. If the switch fails POST, the System LED is amber.

You can use the **show diagnostics post** user EXEC command to display the POST results.



Note

POST failures are usually serious. Contact your Cisco technical support representative if your switch does not pass POST.

Switch LEDs

You must have physical access to the switch to do this. Look at the port LEDs for troubleshooting information about the switch. See the “LEDs” section on page 1-6 for a description of the LED colors and their meanings.

Switch Connections

Bad or Damaged Cable

Always examine the cable for marginal damage or failure. A cable might be just good enough to connect at the physical layer, but it could corrupt packets as a result of subtle damage to the wiring or connectors. You can identify this situation because the port has many packet errors or the port constantly flaps (loses and regains link).

- Examine or exchange the copper or fiber-optic cable with a known, good cable.
- Look for broken or missing pins on cable connectors.
- Rule out any bad patch panel connections or media convertors between the source and the destination. If possible, bypass the patch panel, or eliminate faulty media convertors (fiber-optic-to-copper).
- Try the cable in another port or interface, if possible, to see if the problem follows the cable.

Ethernet and Fiber Cables

Make sure that you have the correct cable type for the connection:

- For Ethernet, use Category 3 copper cable for 10 Mb/s UTP connections. Use either Category 5, Category 5e, or Category 6 UTP for 10/100 or 10/100/1000 Mb/s connections.
- For fiber-optic connectors, verify that you have the correct cable for the distance and port type. Make sure that the connected device ports both match and use the same type encoding, optical frequency, and fiber type.
- For copper connections, determine if a crossover cable was used when a straight-through was required or the reverse. Enable auto-MDIX on the switch, or replace the cable.

Link Status

Verify that both sides have link. A single broken wire or one shutdown port can cause one side to show link, but the other side does not have link.

A port LED does not guarantee that the cable is fully functional. The cable might have encountered physical stress that causes it to function at a marginal level. If the port LED does not turn on:

- Connect the cable from the switch to a known good device.
- Make sure that both ends of the cable are connected to the correct ports.
- Verify that both devices have power.

- Verify that you are using the correct cable type. See [Appendix B, “Connector and Cable Specifications,”](#) for more information.
- Look for loose connections. Sometimes a cable appears to be seated, but is not. Disconnect the cable and then reconnect it.

SFP+ and SFP Module Port Issues

Use only Cisco SFP+ and SFP modules on the switch. Each Cisco module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the module meets the requirements for the switch. Check these items:

- Bad or wrong SFP+ and SFP module. Exchange the suspect module with known good module. Verify that the module is supported on this platform. (The switch release notes on Cisco.com list the SFP+ and SFP modules that the switch supports.)
- Use the **show interfaces** privileged EXEC command to see if the port or module is error-disabled, disabled, or shutdown. Re-enable the port if needed.
- Make sure that all fiber connections are properly cleaned and securely connected.

Port and Interface Settings

An obvious but sometimes overlooked cause of port connectivity failure is a disabled interface. Verify that the interface is not disabled or powered off for some reason. If an interface is manually shut down on one side of the link or the other side, the link does not come up until you re-enable the interface. Use the **show interfaces** privileged EXEC command to see if the interface is error-disabled, disabled, or shutdown on either side of the connection. If needed, re-enable the interface.

Ping the End Device

Ping from the directly connected switch first, and then work your way back port by port, interface by interface, trunk by trunk, until you find the source of the connectivity issue. Make sure that each switch can identify the end device MAC address in its Content-Addressable Memory (CAM) table.

Spanning Tree Loops

STP loops can cause serious performance issues that look like port or interface problems.

Unidirectional links can cause spanning-tree loops. A unidirectional link occurs when the traffic sent by the switch is received by its neighbor, but does not receive traffic sent by the neighbor. A broken fiber-optic cable, other cabling, or a port issue could cause this one-way communication.

The UniDirectional Link Detection (UDLD) protocol helps identify unidirectional link problems. For more information, see the “Understanding UDLD” section in the switch software configuration guide on Cisco.com.

Switch Performance

Speed, Duplex, and Autonegotiation

If the port statistics show a large amount of alignment errors, frame check sequence (FCS), or late-collisions errors, this might mean a speed or duplex mismatch.

A common issue with speed and duplex is when the duplex settings are mismatched between two switches, between a switch and a router, or between the switch and a workstation or server. Mismatches can happen when manually setting the speed and duplex or from autonegotiation issues between the two devices.

To maximize switch performance and to ensure a link, follow one of these guidelines when changing the duplex or speed settings.

- Let both ports autonegotiate both speed and duplex.
- Manually set the speed and duplex parameters for the ports on both ends of the connection.
- If a remote device does not autonegotiate, set the same duplex settings on the two ports. The speed parameter adjusts itself even if the connected port does not autonegotiate.

Autonegotiation and NICs

Problems sometimes occur between the switch and third-party network interface cards (NICs). By default, the switch ports and interfaces are set to autonegotiate. Devices like laptops or other devices are commonly set to autonegotiate, yet sometimes autonegotiation issues occur.

To troubleshoot autonegotiation problems, try manually setting both sides of the connection. If this does not solve the problem, there could be a problem with the firmware or software on your NIC. You can resolve this by upgrading the NIC driver to the latest available version.

Cabling Distance

If the port statistics show excessive FCS, late-collision, or alignment errors, verify that the cable distance from the switch to the connected device meets the recommended guidelines. See the [“Cables and Adapters” section on page B-5](#) for cabling guidelines.

Clearing the Switch IP Address and Configuration

This section describes how to reset the switch by rerunning the initial configuration dialog (system configuration dialog). These are reasons why you might want to reset the switch:

- You installed the switch in your network and cannot connect to it because you assigned the wrong IP address.
- You want to clear all the configuration settings from the switch and assign a new IP address.



Caution

This procedure clears the IP address and all configuration information stored on the switch. Do not follow this procedure unless you want to completely reconfigure the switch.

To reset the switch:

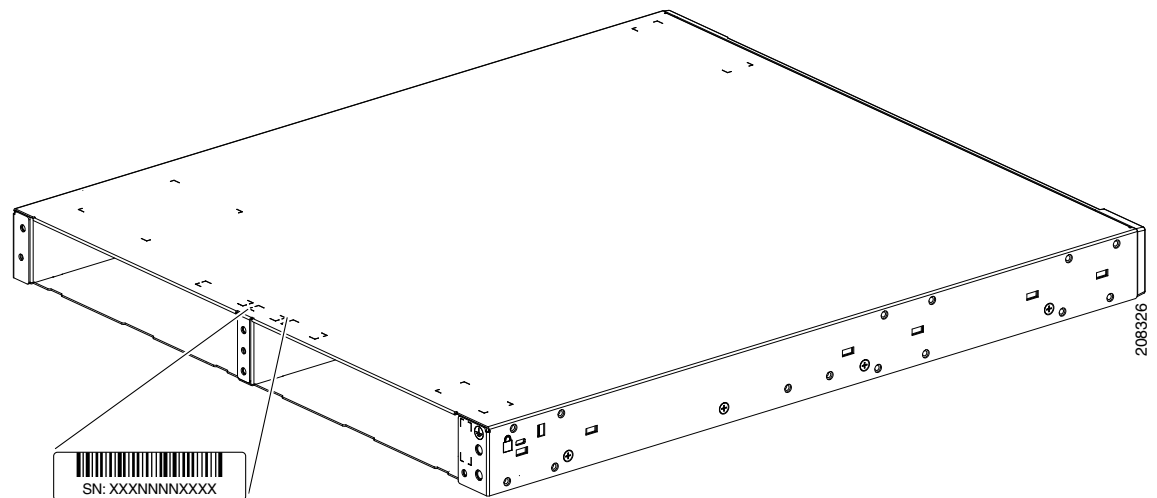
1. At the switch prompt, enter **enable**, and press **Return** or **Enter**.
2. At the privileged EXEC prompt, `switch#`, enter **setup**, and press **Return** or **Enter**.

The switch displays the prompt to run the initial configuration dialog. The switch now behaves like an unconfigured switch. You can configure the switch by using the CLI setup procedure described in [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Finding the Switch Serial Number

If you contact Cisco Technical Assistance, you need to know the serial number of your switch. Use these figures to locate the serial number location. You can also use the **show version** privileged EXEC command or the **show inventory** user EXEC command to get the serial number.

Figure 4-1 Serial Number Location on the Cisco ME 3800X and ME 3600X





APPENDIX A

Technical Specifications

- [Environmental and Technical Specifications for the Switch, page A-1](#)
- [Environmental and Technical Specifications for the Power Supply and Fan Modules, page A-5](#)

Environmental and Technical Specifications for the Switch

Table A-1 *Environmental Ranges for the Switch*

Environmental Ranges	
Operating Environment and Altitude ^{1,2}	Normal Operating Ambient Air Temperature and Altitudes <ul style="list-style-type: none">• 23° to 122°F (–5° to 50°C), up to 1,000 feet (300 m)• 23° to 113°F (–5° to 45°C), up to 6,000 feet (1800 m)• 23° to 104°F (–5° to 40°C), up to 10,000 feet (3000 m)
	Short-Term ³ Exceptional Operating Ambient Air Temperature and Altitudes <ul style="list-style-type: none">• 23° to 140°F (–5° to 60°C), up to 1,000 feet (300 m)• 23° to 131°F (–5° to 55°C), up to 6,000 feet (1800 m)• 23° to 122°F (–5° to 50°C), up to 10,000 feet (3000 m)• 23° to 113°F (–5° to 45°C), at sea level with single fan failure
	Normal Operating Internal Sensor Temperature –4° to 158°F (–20° to 70°C)
Acoustic Noise ⁴	LpA: 43 dB typical, 46 dB maximum LwA: 5.4 B typical, 5.6 B maximum
Relative humidity	5 to 95% (noncondensing) ⁵ .
Storage temperature	–40° to 158°F (–40° to 70°C).
Storage altitude	Up to 15,000 ft (4570 m).

1. GLC-T SFP can only be used from 23° to 122°F (–5° to 50°C) up to 1,000 feet (300 m) environment for normal operating and short-term conditions.
2. The switch supports –5°C operation provided that it powers up at ambient temperature equal to or greater than 0°C. SFP-10G-LRM SFP+ module can only be used from 32° to 122°F (0° to 50°C).
3. Not to exceed more than 96 consecutive hours, 360 total hours, or 15 occurrences in a 1-year period.

4. Acoustic noise is measured per ISO 7779 and declared per ISO 9296.
5. This can be limited by specification of optical modules.

Table A-2 Technical Specifications—ME-3800X-24FS-M

Physical Dimensions	
Weight	14.50 lb (6.58 kg) (no FRU installed)
Dimensions (H x W x D)	1.72 x 17.50 x 20.39 in. (4.37 x 44.45 x 51.79 cm)
AC Power Requirements	
Input voltage	100 to 240 VAC \pm 10% (autoranging), 50 to 60 Hz.
Power consumption with 1 AC power supply module and 1 fan module installed	<p>Total: 779 BTUs per hour (maximum).</p> <p>Maximum: 228 W (worst-case SFPs, SFP+ LRM, 100% traffic).</p> <p>Typical: 155 W (12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic).</p> <p>Minimum: 123 W (no cables or SFP modules installed).</p> <p>Power rating: 120 V (0.254 KVA), 230 V (0.248 KVA).</p>
Power consumption with 2 AC power supply modules installed	<p>Total: 796 BTUs per hour (maximum).</p> <p>Maximum: 233 W (worst-case SFPs, SFP+ LRM, 100% traffic).</p> <p>Typical: 163 W (12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic).</p> <p>Minimum: 132 W (no cables or SFP modules installed).</p> <p>Power rating: 120 V (0.259 KVA), 230 V (0.254 KVA).</p>
DC Power Requirements	
Input voltage	18 to 32 VDC and 36 to 72 VDC.
Power consumption with 1 DC power supply module and 1 fan module installed	<p>Total: 840 BTUs per hour (maximum).</p> <p>Maximum: 246 W (18 VDC input, worst-case SFPs, SFP+ LRM, 100% traffic).</p> <p>Typical: 156 W (48 VDC, 12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic).</p> <p>Minimum: 124 W (48 VDC, no cables or SFP modules installed).</p>
Power consumption with 2 DC power supply modules installed	<p>Total: 813 BTUs per hour (maximum).</p> <p>Maximum: 238 W (18 VDC input, worst-case SFPs, SFP+ LRM, 100% traffic).</p> <p>Typical: 161 W (48 VDC, 12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic).</p> <p>Minimum: 129 W (48 VDC, no cables or SFP modules installed).</p>

**Note**

If you install one AC and one DC power supply module in a switch, the power specifications are similar to two installed DC power supply modules.

Table A-3 Technical Specifications—ME-3600X-24FS-M

Physical Dimensions	
Weight	14.50 lb (6.58 kg) (no FRU installed)
Dimensions (H x W x D)	1.72 x 17.50 x 20.39 in. (4.37 x 44.45 x 51.79 cm)
AC Power Requirements	
Input voltage	100 to 240 VAC \pm 10% (autoranging), 50 to 60 Hz.
Power consumption with 1 AC power supply module and 1 fan module installed	Total: 762 BTUs per hour (maximum). Maximum: 223 W (worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 155 W (12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic). Minimum: 123 W (no cables or SFP modules installed). Power rating: 120 V (0.248 KVA), 230 V (0.243 KVA).
Power consumption with 2 AC power supply modules installed	Total: 778 BTUs per hour (maximum). Maximum: 228 W (worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 163 W (12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic). Minimum: 132 W (no cables or SFP modules installed). Power rating: 120 V (0.254 KVA), 230 V (0.243 KVA).
DC Power Requirements	
Input voltage	18 to 32 VDC and 36 to 72 VDC.
Power consumption with 1 DC power supply module and 1 fan module installed	Total: 823 BTUs per hour (maximum). Maximum: 241 W (18 VDC input, worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 156 W (48 VDC, 12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic). Minimum: 124 W (48 VDC, no cables or SFP modules installed).
Power consumption with 2 DC power supply modules installed	Total: 796 BTUs per hour (maximum). Maximum: 233 W (18 VDC input, worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 161 W (48 VDC, 12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic). Minimum: 129 W (48 VDC, no cables or SFP modules installed).

**Note**

If you install one AC and one DC power supply module in a switch, the power specifications are similar to two installed DC power supply modules.

Table A-4 Technical Specifications—ME-3600X-24TS-M

Physical Dimensions	
Weight	14.15 lb (6.42 kg) (no FRU installed)
Dimensions (H x W x D)	1.72 x 17.50 x 20.39 in. (4.37 x 44.45 x 51.79 cm)
AC Power Requirements	
Input voltage	100 to 240 VAC \pm 10% (autoranging), 50 to 60 Hz.
Power consumption with 1 AC power supply module and 1 fan module installed	Total: 656 BTUs per hour (maximum). Maximum: 192 W (worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 150 W (12 SFPs with 1000Base-SX, 2 SFP+ with SR, 100% traffic). Minimum: 117 W (no cables or SFP modules installed). Power rating: 120 V (0.214 KVA), 230 V (0.209 KVA).
Power consumption with 2 AC power supply modules installed	Total: 677 BTUs per hour (maximum). Maximum: 198 W (worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 158 W (12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic). Minimum: 126 W (no cables or SFP modules installed). Power rating: 120 V (0.220 KVA), 230 V (0.215 KVA).
DC Power Requirements	
Input voltage	18 to 32 VDC and 36 to 72 VDC.
Power consumption with 1 DC power supply module and 1 fan module installed	Total: 711 BTUs per hour (maximum). Maximum: 208 W (18 VDC input, worst-case SFPs, SFP+ LRM, 100% traffic). Typical: 151 W (48 VDC, 12 SFPs with 1000BASE-SX, 2 SFP+ with SR, 100% traffic). Minimum: 117 W (48 VDC, no cables or SFP modules installed).
Power consumption with 2 DC power supply modules installed	Total: 697 BTUs per hour (maximum). Maximum: 204 W, 18 VDC input (maximum fan speed, all ports linked). Typical: 157 W (48 VDC, SFP modules installed, 12 ports linked). Minimum: 124 W (48 VDC, no SFP modules installed).

**Note**

If you install one AC and one DC power supply module in a switch, the power specifications are similar to two installed DC power supply modules.

Environmental and Technical Specifications for the Power Supply and Fan Modules

Table A-5 *Environmental and Physical Specifications for the AC and DC Input Power Supply and Fan Modules*

Environmental Ranges	
Operating temperature	–40 to 122°F (–40 to 50°C)
Storage temperature	–49 to 185°F (–45 to 85°C)
Relative humidity	5 to 95% (noncondensing)
Altitude	Up to 10,000 ft (3049 m)
Physical Specifications	
Weight	AC: 2.9 lb (1.32 kg) DC: 3.1 lb (1.41 kg) Fan: 1.65 lb (0.75 kg)
Dimensions (H x W x D)	1.64 x 8.55 x 5.94 in. (4.16 x 21.72 x 15.09 cm)

Table A-6 *Technical Specifications for the AC Power Supply Module*

Power Specifications	
Maximum output power	390 W
Input voltage range and frequency	100 to 240 VAC \pm 10% (autoranging), 50 to 60 Hz
Input current	5 to 2.5 A Note For AC input, a 5A fuse is recommended.
Maximum output ratings	12 V @ 32.5 A
Total input BTU	1705 BTUs per hour

Table A-7 *Technical Specifications for the DC Power Supply Module*

Power Specifications	
Maximum output power	390 W
Input voltage range	18 to 32 VDC and 36 to 72 VDC
Input current	30 A maximum at minimum input 18VDC 15 A maximum at maximum input voltage 72VDC Note For DC input, a 25A fuse is recommended.
Maximum output ratings	12 V @ 32.5 A
Total input BTU	1840 BTUs per hour



APPENDIX **B**

Connector and Cable Specifications

- [Connector Specifications, page B-1](#)
- [Cables and Adapters, page B-5](#)

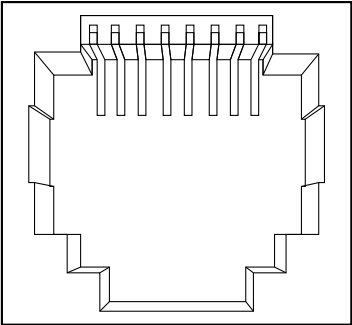
Connector Specifications

- [10/100/1000, page B-1](#)
- [SFP and SFP+ Module Connectors, page B-2](#)
- [10/100/1000 Ethernet Management Port, page B-3](#)
- [Alarm Input Port, page B-3](#)
- [BITS Port, page B-4](#)

10/100/1000

The 10/100/1000 Ethernet ports use standard RJ-45 connectors and Ethernet pinouts.

Figure B-1 **10/100/1000 Port Pinouts**

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

SFP and SFP+ Module Connectors

Figure B-2, Figure B-3, and Figure B-4 show the SFP module connectors.

The Cisco ME 3800X and ME 3600X switches support the SFP module patch cable, a 0.5-meter, copper, passive cable with SFP module connectors at each end (Figure B-5). The patch cable can connect two Cisco ME 3800X and ME 3600X switches in a cascaded configuration.

Figure B-2 Duplex LC Cable Connector

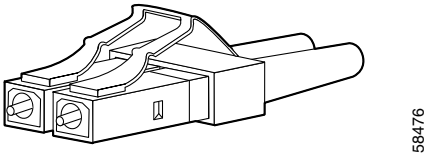


Figure B-3 Simplex LC Cable Connector

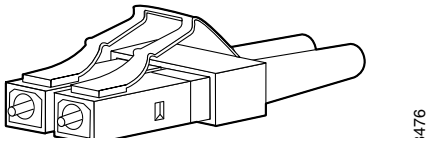
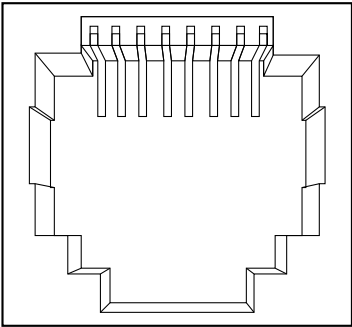
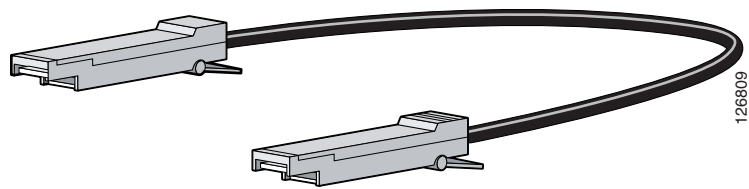


Figure B-4 Copper SFP Module RJ-45 Connector

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

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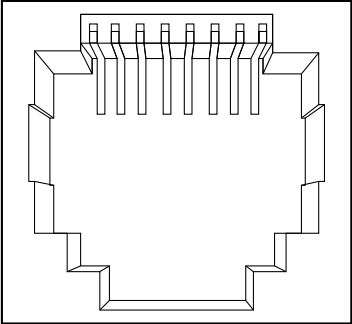
Figure B-5 SFP Module Patch Cable



10/100/1000 Ethernet Management Port

The 10/100/1000 Ethernet management port uses standard RJ-45 connectors with Ethernet pinouts.

Figure B-6 10/100/1000 Port Pinouts

Pin	Label	1	2	3	4	5	6	7	8
1	TP0+								
2	TP0-								
3	TP1+								
4	TP2+								
5	TP2-								
6	TP1-								
7	TP3+								
8	TP3-								

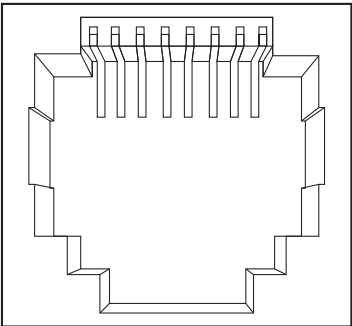
Alarm Input Port

The alarm input port uses a standard RJ-45 connector. See [“Alarm Input Port” section on page 1-3](#) for more information.



Note We recommend using a shielded cable grounded at both ends for NEBS.

Figure B-7 Alarm Input Port Pinouts

Pin	Alarm connection	1 2 3 4 5 6 7 8
1	Alarm 1 input	
2	Alarm 2 input	
3	no connection	
4	Alarm 3 input	
5	Alarm 4 input	
6	no connection	
7	no connection	
8	Alarm common	

280950

BITS Port


Note

We recommend using a shielded cable for the BITS port.

Table B-1 BITS RJ-45 Receptacle Pinouts

Pin	Signal	Direction	Description
1	RX Ring	Input	Receive ring
2	RX TIP	Input	Receive (T1/E1)
3	N/C		
4	TX Ring	Output	Output ring
5	TX TIP	Output	Output (T1/E1)
6	N/C		
7	N/C		
8	N/C		

Cables and Adapters

- [SFP and SFP+ Module Cabling, page B-5](#)
- [Cable Pinouts, page B-7](#)
- [Console Port Adapter Pinouts, page B-8](#)

SFP and SFP+ Module Cabling

Each port must match the wave-length specifications on the other end of the cable, and for reliable communications, the cable must not exceed the required cable length. Copper 1000BASE-T SFP transceivers use standard four twisted-pair, Category 5 (or greater) cable at lengths up to 328 feet (100 meters).

Table B-2 *Fiber-Optic SFP Module Port Cabling Specifications*

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km) ¹	Cable Distance
100BASE-BX (GLC-FE-100BX-D GLC-FE-100BX-U)	1310 TX 1550 RX	SMF	G.652 ²	—	32,810 feet (10 km)
100BASE-EX	1310	SMF	G.652 ²	—	131,240 ft (40 km)
100BASE-FX (GLC-GE-100FX)	1310	MMF	50/125 62.5/125	500 500	6,562 feet (2 km) 6,562 feet (2 km)
100BASE-FX (GLC-FE-100FX)	1310	MMF	50/125 62.5/125	500 500	6,562 feet (2 km) 6,562 feet (2 km)
100BASE-LX (100BASE-LX10)	1310	SMF	G.652 ²	—	32,810 feet (10 km)
100BASE-ZX	1550	SMF	G.652	—	262,480 ft (80 km)
1000BASE-BX10-D (GLC-BX-D)	1490 TX 1310 RX	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-BX10-U (GLC-BX-U)	1310 TX 1490 RX	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-SX (GLC-SX-MM)	850	MMF	62.5/125 62.5/125 50/125 50/125	160 200 400 500	722 feet (220 m) 902 feet (275 m) 1640 feet (500 m) 1804 feet (550 m)
1000BASE-LX/LH (GLC-LH-SM)	1310	MMF ³ SMF	62.5/125 50/125 50/125 G.652 ²	500 400 500 —	1804 feet (550 m) 1804 feet (550 m) 1804 feet (550 m) 32,810 feet (10 km)
1000BASE-ZX (GLC-ZX-SM)	1550	SMF	G.652 ²	—	43.4 to 62 miles (70 to 100 km) ⁴
CWDM	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	SMF	G.652 ²	—	62 miles (100 km)

Table B-2 *Fiber-Optic SFP Module Port Cabling Specifications (continued)*

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km) ¹	Cable Distance
DWDM	1560.61, 1559.79, 1558.98, 1558.17, 1556.55, 1554.55, 1554.94, 1554.13, 1552.13, 1551.72, 1550.92, 1550.12, 1548.51, 1547.72, 1546.92, 1546.12, 1546.12, 1544.53, 1543.73, 1542.94, 1542.14, 1540.56, 1539.77, 1538.98, 1536.61, 1535.82, 1535.04, 1534.25, 1532.68, 1531.90, 1531.12, 1530.33	SMF	G.652 ²	—	62 miles (100 km)
10GBASE-LR (SFP-10G-LR)	1310	SMF	G.652 ²		6.21 miles (10 km)
10GBASE-SR (SFP-10G-SR)	850	MMF	62.5/125 62.5/125 50/125 50/125 50/125	160 200 400 500 2000	85 feet (26 m) 108 feet (33 m) 216 feet (66 m) 269 feet (82 m) 6,561 feet (2000 m)
10GBASE-CX1 (SFP-H10GB-CU1M)	—	Twinax cable, 30-AW cable assembly	—	—	3 feet (1 m)
(SFP-H10GB-CU3M)		Twinax cable, 24-AWG cable assembly			9 feet (3 m)
(SFP-H10GB-CU5M)		Twinax cable, 30-AWG cable assembly			16 feet (5 m)

1. Modal bandwidth applies only to multimode fiber.
2. A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers.
3. Requires a mode-conditioning patch cord. An ordinary patch cord with MMF, 1000BASE-LX/LH SFP modules, and a short link distance can cause transceiver saturation, resulting in an elevated bit error rate (BER). When using the LX/LH SFP module with 62.5-micron diameter MMF, you must also install a mode-conditioning patch cord between the SFP module and the MMF cable on both the sending and receiving ends of the link. Link distances greater than 984 feet (300 m) require the mode-conditioning patch cord.
4. 1000BASE-ZX SFP modules can send data up to 62 miles (100 km) by using dispersion-shifted SMF or low-attenuation SMF; the distance depends on the fiber quality, the number of splices, and the connectors.

**Note**

When the fiber-optic cable span is less than 15.43 miles (25 km), you should insert a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module at each end of the link.

Cable Pinouts

Figure B-8 Two Twisted-Pair Straight-Through Cable Schematic

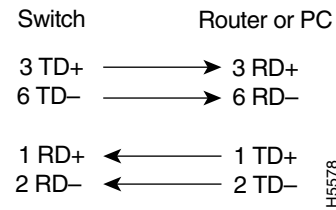


Figure B-9 Two Twisted-Pair Crossover Cable Schematic

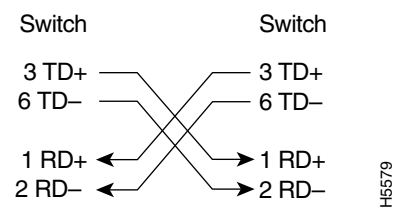


Figure B-10 Four Twisted-Pair Straight-Through Cable Schematic for 1000BASE-T Ports

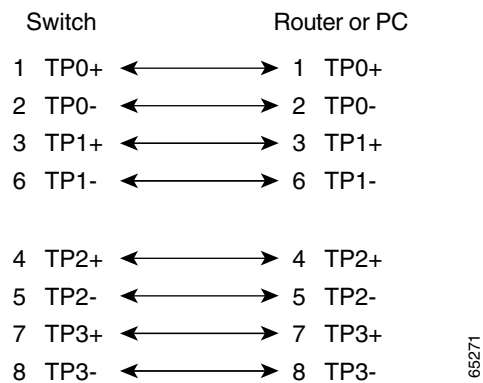
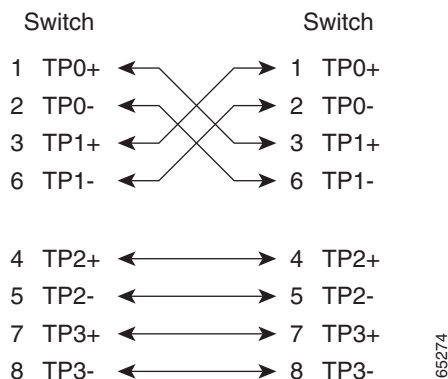
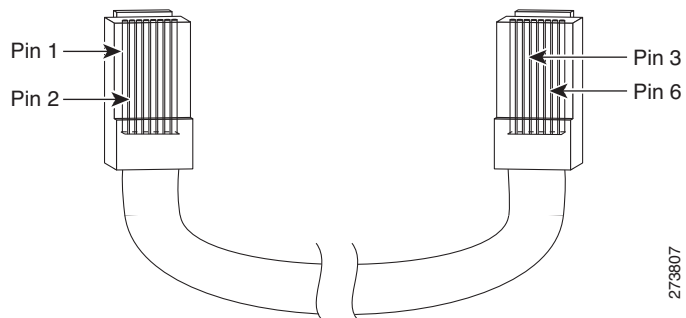


Figure B-11 Four Twisted-Pair Crossover Cable Schematics for 1000BASE-T Ports

To identify a crossover cable, compare the two modular ends of the cable. Hold the cable ends side-by-side, with the tab at the back. The wire connected to pin 1 on the left plug should be the same color as the wire connected to pin 3 on the right plug. The wire connected to pin 2 on the left plug should be the same color as the wire connected to pin 6 on the right plug.

Figure B-12 Identifying a Crossover Cable

Console Port Adapter Pinouts

The console port uses an 8-pin RJ-45 connector, which is described in [Table B-3](#) and [Table B-4](#). If you did not order a console cable with your switch, you need to provide an RJ-45-to-DB-9 adapter cable to connect the console port of the switch to a console PC. You need to provide an RJ-45-to-DB-25 female DTE adapter if you want to connect the switch console port to a terminal. You can order a kit (part number ACS-DSBUASYN=) containing that adapter from Cisco. For console port and adapter pinout information, see [Table B-3](#) and [Table B-4](#).

Table B-3 lists the pinouts for the console port, the RJ-45-to-DB-9 adapter cable, and the console device.

Table B-3 Console Port Signaling Using a DB-9 Adapter

Switch Console Port (DTE)	RJ-45-to-DB-9 Terminal Adapter	Console Device
Signal	DB-9 Pin	Signal
RTS	8	CTS
DTR	6	DSR
TxD	2	RxD
GND	5	GND
GND	5	GND
RxD	3	TxD
DSR	4	DTR
CTS	7	RTS

Table B-4 lists the pinouts for the console port, RJ-45-to-DB-25 female DTE adapter, and the console device.



Note

The RJ-45-to-DB-25 female DTE adapter is not supplied with the switch. You can order a kit (part number ACS-DSBUASYN=) containing this adapter from Cisco.

Table B-4 Console Port Signaling Using a DB-25 Adapter

Switch Console Port (DTE)	RJ-45-to-DB-25 Terminal Adapter	Console Device
Signal	DB-25 Pin	Signal
RTS	5	CTS
DTR	6	DSR
TxD	3	RxD
GND	7	GND
GND	7	GND
RxD	2	TxD
DSR	20	DTR
CTS	4	RTS



APPENDIX **C**

Configuring the Switch with the CLI-Based Setup Program

This appendix provides a CLI-based setup procedure for a standalone switch. Before connecting the switch to a power source, review the safety warnings in [Chapter 2, “Switch Installation”](#) and [Chapter 3, “Installing and Removing AC and DC Input Power Supply and Fan Modules.”](#)

Accessing the CLI Through the Console Port

You can access the CLI on a configured or unconfigured switch by connecting the console port of the switch to the serial port on your PC or workstation and accessing the switch through a Telnet session.

Starting the Terminal-Emulation Software

Before you power on the switch, start the terminal emulation session so that you can see the output display from the power-on self-test (POST).

The terminal-emulation software—frequently a PC application such as Hyperterminal or ProcommPlus—makes communication between the switch and your PC or terminal possible.

Follow these steps to start a terminal-emulation session:

-
- | | |
|---------------|--|
| Step 1 | Start the terminal-emulation program if you are using a PC or terminal. |
| Step 2 | Configure the baud rate and character format of the PC or terminal to match these console port default characteristics: <ul style="list-style-type: none">• 9600 baud or 115200 baud (suggested rate)• 8 data bits• 1 stop bit• No parity• None (flow control) |
-

To power on the switch, connect one end of the AC power cord to the AC power connector on the switch, and connect the other end of the power cord to an AC power outlet.

To power on a DC switch, see [Chapter 3, “Installing and Removing AC and DC Input Power Supply and Fan Modules.”](#)

Entering the Initial Configuration Information

To set up the switch, you need to complete the setup program, which runs automatically after the switch is powered up. You must assign an IP address and other configuration information necessary for the switch to communicate with the local routers and the Internet.

IP Settings

You will need this information from your network administrator before you complete the setup program:

- Switch IP address
- Subnet mask (IP netmask)
- Default gateway (router)
- Enable secret password
- Enable password
- Telnet password

Completing the Setup Program

Follow these steps to complete the setup program and to create an initial configuration for the switch:

Step 1 Enter **Yes** at these two prompts.

Would you like to enter the initial configuration dialog? [yes/no]: **yes**

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system.

Would you like to enter basic management setup? [yes/no]: **yes**

Step 2 Enter a host name for the switch, and press **Return**.

On a command switch, the host name is limited to 28 characters; on a member switch to 31 characters. Do not use *-n*, where *n* is a number, as the last character in a host name for any switch.

Enter host name [Switch]: *host_name*

Step 3 Enter an enable secret password, and press **Return**.

The password can be from 1 to 25 alphanumeric characters, can start with a number, is case sensitive, allows spaces, but ignores leading spaces. The secret password is encrypted and the enable password is in plain text.

```
Enter enable secret: secret_password
```

Step 4 Enter an enable password, and press **Return**.

```
Enter enable password: enable_password
```

Step 5 Enter a virtual terminal (Telnet) password, and press **Return**.

The password can be from 1 to 25 alphanumeric characters, is case sensitive, allows spaces, but ignores leading spaces.

```
Enter virtual terminal password: terminal-password
```

Step 6 (Optional) Configure Simple Network Management Protocol (SNMP) by responding to the prompts. You can also configure SNMP later through the CLI. To configure SNMP later, enter **no**.

```
Configure SNMP Network Management? [no]: no
```

```
Current interface summary
```

```
Any interface listed with OK? value ''NO'' does not have a valid configuration
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0	unassigned	NO	unset	up	up
Vlan1	unassigned	NO	unset	up	up
GigabitEthernet0/1	unassigned	YES	unset	up	up
GigabitEthernet0/2	unassigned	YES	unset	up	up
GigabitEthernet0/3	unassigned	YES	unset	up	up
GigabitEthernet0/4	unassigned	YES	unset	up	up
GigabitEthernet0/5	unassigned	YES	unset	up	up
GigabitEthernet0/6	unassigned	YES	unset	up	up
GigabitEthernet0/7	unassigned	YES	unset	up	up
GigabitEthernet0/8	unassigned	YES	unset	up	up
GigabitEthernet0/9	unassigned	YES	unset	up	up
GigabitEthernet0/10	unassigned	YES	unset	up	up
GigabitEthernet0/11	unassigned	YES	unset	down	down
GigabitEthernet0/12	unassigned	YES	unset	down	down
GigabitEthernet0/13	unassigned	YES	unset	up	up
GigabitEthernet0/14	unassigned	YES	unset	up	up
GigabitEthernet0/15	unassigned	YES	unset	up	up
GigabitEthernet0/16	unassigned	YES	unset	up	up
GigabitEthernet0/17	unassigned	YES	unset	up	up
GigabitEthernet0/18	unassigned	YES	unset	up	up
GigabitEthernet0/19	unassigned	YES	unset	up	up
GigabitEthernet0/20	unassigned	YES	unset	up	up
GigabitEthernet0/21	unassigned	YES	unset	up	up
GigabitEthernet0/22	unassigned	YES	unset	up	up
GigabitEthernet0/23	unassigned	YES	unset	up	up
GigabitEthernet0/24	unassigned	YES	unset	up	up
TenGigabitEthernet0/1	unassigned	YES	unset	up	up
TenGigabitEthernet0/2	unassigned	YES	unset	up	up

Step 7 Enter the interface name (physical interface or VLAN name) of the interface that connects to the management network, and press **Return**. For this release, always use vlan1 as that interface.

```
Enter interface name used to connect to the
management network from the above interface summary: vlan1
```

- Step 8** Configure the interface by entering the switch IP address and subnet mask and pressing **Return**. The IP address and subnet masks shown below are examples.

```
Configuring interface vlan1:
Configure IP on this interface? [yes]: yes
IP address for this interface: 10.4.120.106
Subnet mask for this interface [255.0.0.0]: 255.0.0.0
```

You have now completed the initial configuration of the switch, and the switch displays its initial configuration. This is an example of output that appears:

```
The following configuration command script was created:
hostname switch1
enable secret 5 $1$U1q8$D1A/OiaEbl90WcBPd9cOn1
enable password enable_password
line vty 0 15
password terminal-password
no snmp-server
!
no ip routing

!
interface Vlan1
no shutdown
ip address 10.4.120.106 255.0.0.0
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2

interface GigabitEthernet0/3
!
...<output abbreviated>
end
```

- Step 9** These choices appear:

```
[0] Go to the IOS command prompt without saving this config.

[1] Return back to the setup without saving this config.

[2] Save this configuration to nvram and exit.
```

If you want to save the configuration and use it the next time the switch reboots, save it in NVRAM by selecting option 2.

```
Enter your selection [2]:2
```

Make your selection, and press **Return**.

After you complete the setup program, the switch can run the default configuration that you created. If you want to change this configuration or want to perform other management tasks, use the CLI.

To use the CLI, enter commands at the *Switch>* prompt through the console.